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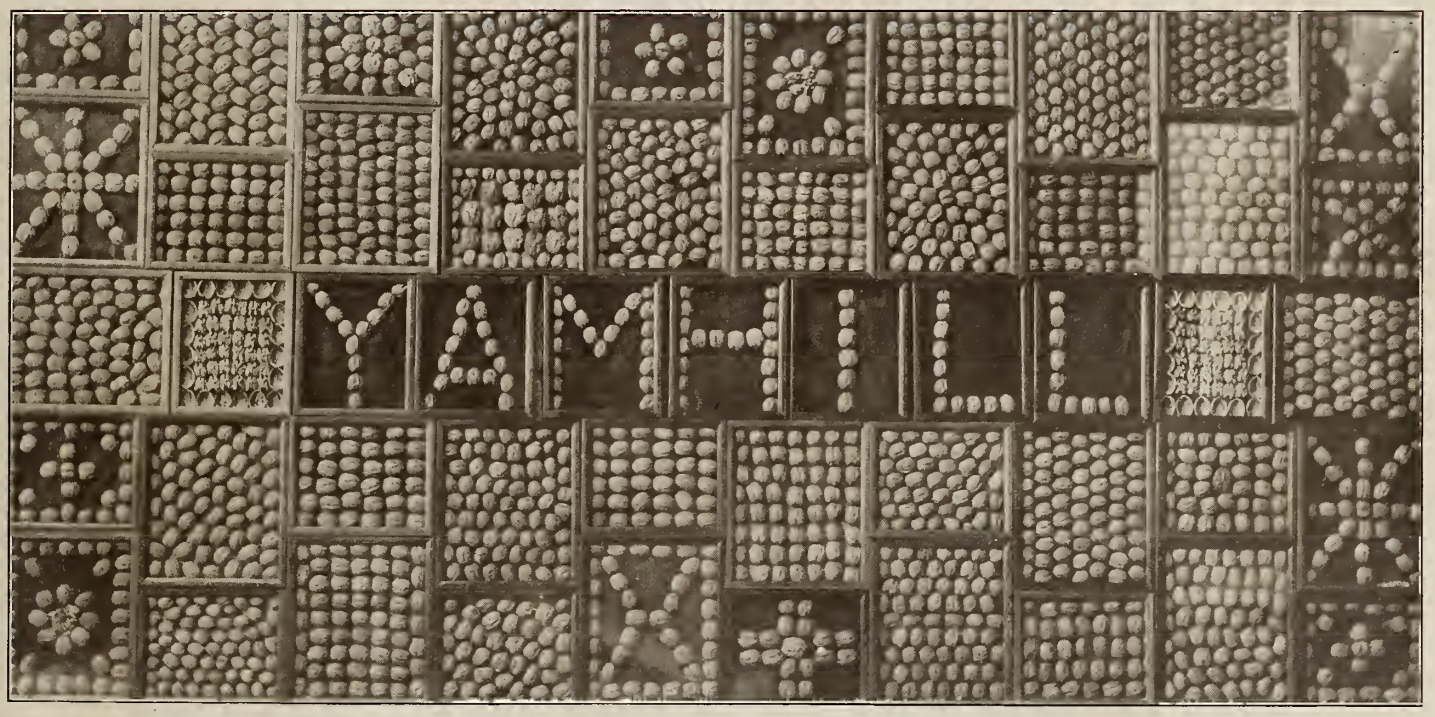
VOLUME FOUR NUMBER TWO DOLLAR A YEAR

BETTER FRUIT

August 1909

WALNUT SPECIAL



HANDSOME EXHIBIT AT THE ALASKA-YUKON-PACIFIC EXPOSITION, SEATTLE, 1909, BY THE YAMHILL COUNTY WALNUT CLUB, McMINNVILLE, OREGON

PUBLISHED BY

BETTER FRUIT PUBLISHING COMPANY

HOOD RIVER, OREGON

WHITE SALMON
Apple Land

For Sale on Easy Terms

10 acres, uncleared, per acre, $90
40 acres, 175 trees, 5 acres cultivated, $4000
40 acres, uncleared, $3500
20 acres, partly improved, $7000
160 acres, 20 acres cleared, $8000
40 acres, 15 acres in orchard, remainder nearly cleared, for $6000
160 acres, 60 acres nearly cleared, $8000
40 acres timber, $1600
80 acres, 50 acres cleared, 600 trees, two-year-old, $10,000
40 acres, 4 acres orchard, 6 acres hay, 20 acres cleared, $5000
400 acres, a good development proposition

VAN VORST AND WELLS
WHITE SALMON, WASHINGTON

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BECAUSE it is better than any other fruit growers' paper published in the world, for the practical fruit grower. This edition is devoted especially to walnuts

If you are a fruit grower send for a sample copy of one of our fruit editions

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Prunes Peaches Pears Plums Apples

THE LAND OF OPPORTUNITY

Three-Year-Old Spitzenberg Apple Tree at White Salmon

Located across the Columbia River from Hood River, Oregon, the White Salmon Valley offers the greatest opportunities of any land on earth to fruit growers. Where apples, cherries, pears, peaches, prunes and strawberries grow to perfection. A few dollars invested in fruit land today will return to you in a very few years sixty-fold. The soil, climate, water and scenery are unsurpassed by that of any country. Build a home where you can enjoy peace and plenty the remainder of your life. Fruit lands cleared, planted and cared for until in a bearing condition. Write us for descriptive matter and prices.

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WILL MAKE A MAN RICH ON TEN ACRES OF

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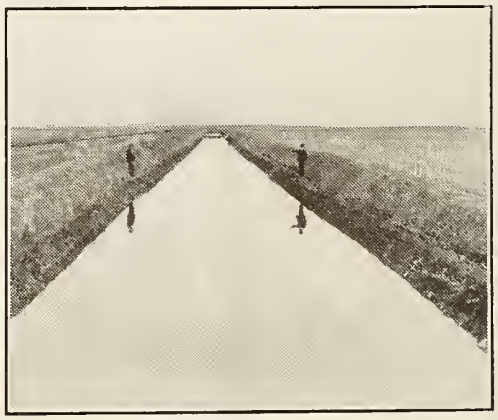

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under the largest and best constructed Irrigation Canal in Eastern Washington. Close to a city of 120,000 people. Electric and Steam Railroads at your door. Fine climate; beautiful roads. A pleasant place to live.

WRITE FOR INFORMATION. IT IS FREE

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110 Stevens Street *SPOKANE, WASH*

Oregon English Walnuts

Plantings in five, ten or twenty acre tracts with exceptional prices and easy terms.

We are the *pioneer* planters of the English Walnut in Oregon. *Our* plantings are the *largest in the world. Our* sales equal *95 per cent.* of all walnut plantings *ever sold in Oregon.*

Our lands were first choice and selected for Walnut culture. Our location has *never been visited by frost.*

Twenty years' actual experience applied to selection of soils and all features of planting and care.

We are planters with endorsement of all reliable authorities, professional and otherwise.

Every purchaser of our tracts will double their investment inside of three years.

Walnuts give as large net returns as the best of apples, with constant care and expense eliminated.

Having planted 90 per cent. of all plantings in Oregon, having sold 95 per cent. of all tracts ever sold in Oregon, we solicit your consideration.

Catalogue and details of prices and terms on request.

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Established 1878

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California, Oregon, Washington, Idaho and Florida fruits. Apples handled in all European Markets. *Checks mailed from our New York office same day apples are sold on the other side.* We are not agents; we *sell* apples We make a specialty of handling Cherries, Apricots, Peaches and all early fruits on the New York market. *Correspondence solicited*

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WE HANDLE ANNUALLY 1500 CARS
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WRITE US ON APPLES, PEACHES, PRUNES, PEARS, AND ANYTHING ELSE IN OUR LINE WHICH YOU MAY HAVE TO OFFER

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Superior facilities for handling

PEACHES APPLES AND PEARS

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Reliable Market Reports *Prompt Cash Returns*

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Pioneer fruit packers and shippers of this famous section. "Quality" is our watchword, and "Fruit Worth the Price" is our motto. Wire or write us for apples, strawberries or pears in season in car lots or smaller shipments. Other fruits in season in less quantities.

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We have modern cold storage facilities essential for the handling of your products. Reliable market reports

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Packers and shippers of the

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PLUMS, PEARS APPLES

Strawberries, Loganberries
Raspberries, Currants, Goosberries
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sold on the grounds this year will be ours exclusively. If you have anything nice to ship we can use it. Write us today.

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FRUIT AND COMMISSION MERCHANTS

Cipher codes: Revised Economy, Modern Economy, Earl Fruit Company

References: Merchants National Bank, Fargo National Bank, Commercial Bank

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NORTH YAKIMA, WASH.

E. E. Samson, Manager

APPLES, PEARS, PRUNES, PLUMS, PEACHES, CHERRIES, APRICOTS, GRAPES AND CANTALOUPES

Mixed carloads start about July 20. Straight carloads in season. Our fruit is the very best grade, and pack guaranteed.

We Use Revised Economy Code

Apple Storage

ST. LOUIS is the best local market and distributing point to ship your apples, and hold on cold storage, for highest winter prices.

OREGON, WASHINGTON & IDAHO
Fruit Associations, Growers & Shippers

I solicit your carload shipments of box apples this fall for cold storage here. Will advance freights and pay insurance, charging usual commission and interest.

Storage rates 15 cents per box for season ending May 1.

Only Extra Fancy Fruit wanted.

I do business with the Mound City Ice and Cold Storage Company, the largest and most modern apple storage house in the middle West. Cars unloaded direct into coolers.

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Established in Helena Quarter of a Century

Branch houses: Great Falls, Montana; Missoula, Montana; Billings, Montana.

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Chelan County won 35 gold medals on fruit exhibits at the Portland Exposition, 1905. This record was not equaled by any other county on the Pacific Coast. We will have 75 to 100 cars of apples: Winesaps, Spitzenberg, Rome Beauties, Lawvers, Jonathans, etc., all packed under the supervision of this association. Correspondence solicited.

Wenatchee Valley Fruit Growers' Association

WENATCHEE, WASHINGTON

M. O. TIBBETTS, *President* E. T. BALCH, *Secretary*

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Mosier Valley Fruits

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Growers and Shippers of
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Specialties: Apples, Peaches, Pears and Cantaloupes
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Apples, Peaches and Strawberries
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Consignments solicited with quick returns
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BUTTER AND EGGS
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206 Stark St., Portland, Oregon
Between Front and First Streets

FAMOUS HOOD RIVER
Strawberries
THE FINEST BERRY ON EARTH AND THE BEST SHIPPER
LOOK GOOD, BUT TASTE BETTER
Fancy Pack Guaranteed
FRUIT GROWERS UNION
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SOLICIT YOUR CONSIGNMENTS
Top Prices and Prompt Returns
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APPLES
Spitzenbergs, Newtowns,
Jonathans, Arkansas Blacks, Ortleys, Winesaps, R. C. Pippins, Baldwins, M. B. Twigs, Ben Davis
Look Good, Taste Better, Sell Best
GRADE AND PACK GUARANTEED
Apple Growers' Union
Hood River, Oregon

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The proper handling and distribution of deciduous

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in car lots, guaranteed by ten years' actual experience

Investigate us as to experience, ability and responsibility

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SGOBEL & DAY

NEW YORK

APPLES, PEARS, PRUNES

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Clarence Nelson, *Secretary*

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PAONIA, COLORADO

We will make a specialty of filling f. o. b. orders on Elberta Peaches and high grade Jonathan, Rome Beauty and other North Fork Apples this season and invite correspondence from those who will be in the market to buy. Let us put your name on our list and will keep you advised and quote you when shipments are ready to move.

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BRANCH HOUSES:
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Wholesale Fruit and Produce

WE HAVE MODERN COLD STORAGE FACILITIES ESSENTIAL FOR HANDLING YOUR PRODUCTS

A strong house that gives reliable market reports *and prompt cash returns*

The
Lawrence-Hensley Fruit Co.

Successors to
THE LIEBHARDT FRUIT CO.

Jobbers of
Fruits and Vegetables
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Denver, Colorado

Greater Activity and Development than any Point on Line

Put Your Cash Where the Arrow Points. There is Leaven in it

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J. J. REID, President 340 Chamber of Commerce, Portland, Oregon

Nut and Fruit Tracts in

CLIFFS ACRES
GOODNOE HILLS
RIVER FRONT TRACTS

All in the Vicinity of
CLIFFS, WASH.

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Wholesale Fruit Merchants

Largest receivers and distributers of Western apples, strawberries, raspberries and blackberries in Nebraska. Send us your shipments. We will get you the highest market prices and remit promptly.

Correspondence Cheerfully Answered

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With best of prices, scenery, climate, transportation, soil, mountain water, timber, etc. Send for our list of lands and literature

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First Premium State Fair 1907-08

Corvallis, Oregon

County seat of Benton, in the heart of the famous Willamette Valley. Greatest dairy section of the West. Land unsurpassed for walnuts and fruit. Irrigation not required. Apples and peaches have better flavor and keep longer than those grown under irrigation. Extensive plantings of commercial orchards near Corvallis. The best farm lands cheaper than at any place in the valley; no inflated values. Corvallis has a population of 6,000; 200 new residences constructed since January 1, 1908. Oregon Agricultural College, the largest educational institution in the Northwest, 1,500 students, located here. Pure mountain water and all modern conveniences. No extremes in temperature. Opportunities here worth your while. For particulars write

CORVALLIS COMMERCIAL CLUB

HUDSON LAND CO.

The Dalles, Oregon

Fruit, Wheat and Stock Farms

For sale in Eastern Oregon and Washington. Acre tracts in any quantity desired, with or without trees planted, within one mile of city. We are sole agents for the sale of five and ten-acre tracts in Peachland Park, which we can sell you on easy installments and care for the orchard until it is in full bearing. This is a beautiful tract of land situate one mile west and overlooking the city. The soil is a rich, deep, sandy loam, and is set out on the most approved methods to peaches and cherries. Some of the trees are three years old. Write to us for full particulars.

Fruit Land in the Rich Chehalem Valley

Do you want to prosper? Do you want to live happy? Do you want to be healthy, wealthy and wise? Then buy fruit land in the Chehalem Valley, near Newberg, Yamhill County.

We own some of the best fruit land that can be found in the valley—all cleared, ready for setting; rich, deep soil, perfect drainage, no waste. It is fruit land in a fruit district. Only twenty-four miles from Portland.

We are selling ten-acre tracts for reasonable prices and easy terms. Call at our office or write us for full particulars.

YAMHILL FRUIT LAND COMPANY, Owners

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Willamette Valley Fruit Lands

in tracts to suit. Rich soil, delightful climate. For descriptive literature write

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Hood River, Oregon

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Land for Strawberries
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Live facts in a lively way. Live facts for men and women. Facts that affect you—your family

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APPLE LANDS

Are paying from $400 to $700 an acre to their owners. Many started in a small way, today they are independent. You can begin today. It pays to see us

He who investigates for himself becomes "the man who knows"

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Hood River, Oregon

HOOD RIVER APPLE LAND
For Sale on Easy Terms

10 acres, uncleared, per acre	$125
20 acres, complete place	$20,000
24 acres, 500 trees	$5000
40 acres, 7 acres in trees	$5000
40 acres, uncleared	$1600
80 acres, uncleared	$2000
148 acres, partly cleared	$5000
62 acres, 800 trees	$10,220

J. Adrian Epping, Hood River, Oregon

ROGUE RIVER VALLEY

Famous for its APPLES, PEARS, PEACHES, GRAPES, MELONS AND CLIMATE

THE natural home of the Spitzenberg and Newtown apples. Rogue River pears have led the United States for past five years in the highest price in the New York market. No peaches of the South excel those of Rogue River, and trees are healthy. Grapes perfection in color and flavor and the best of shippers, and growers have more orders than they can fill. Rogue River canteloupes, watermelons and cassabas, none better and big money makers. The Rogue River Fruit Growers' Union gets the highest price for fruit, and the Southern Pacific gives terminal rates on shipments East. Climate the perfect medium between arid California and webfoot Oregon. No storms or winds to injure fruit crop. Almonds and figs ripen perfectly and palms grow in the yards. Land yet cheap, but will double in two years. American community and good schools, rural mails, telephones, etc. Full information by addressing CHARLES MESERVE, Medford, Oregon, Seller of *Real Estate in All Parts of Rogue River Valley*. References by permission: Rogue River Fruit Growers' Union, First National Bank of Medford.

Fruit, Walnut and Farm Lands

One to 2,000 acres, in good location, ranging in price from $30 to $150 per acre. See us for bargains.

THE McMINNVILLE LAND COMPANY
McMinnville, Yamhill County, Oregon

ALMOND-PEACH-APRICOT CHERRY AND GRAPE LAND IN "GOODNOE HILLS" FARMS

10 OR 20 ACRES WILL PRODUCE A GOOD INCOME FOR LIFE

$100 PER ACRE EASY TERMS

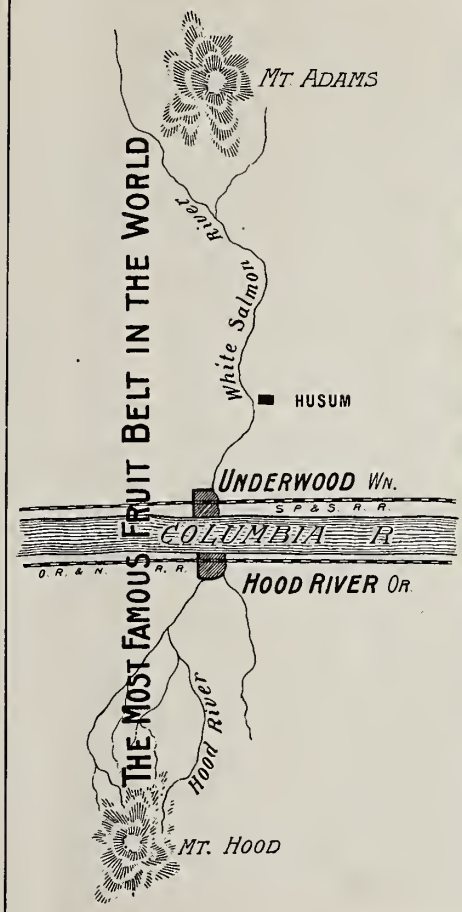
FOR INFORMATION CALL OR WRITE

DABNEY & DABNEY, 412 COMMERCIAL BLOCK 2D & WASHINGTON PORTLAND, ORE.

MOSIER
Also called East Hood River
FRUIT LANDS

In large or small tracts. Some very good land at low prices at present. Good growing community. Six miles east of Hood River. Parties wishing to buy will do well to write or see

GEO. CHAMBERLAIN
MOSIER, OREGON



UNDERWOOD

The Gateway to the White Salmon Valley

WHITE SALMON VALLEY FRUIT GROWER S' UNION OF UNDERWOOD, WASHINGTON, Won three important premiums at Spokane—First on Best Four-Tier Newtowns, Second on Best Ten Boxes Newtowns, First on Best Pack.

Twenty minutes from Hood River by ferry. Two hours by rail, seven hours by boat from Portland. Twenty-five thousand acres first-class fruit land tributary to this point. Has a strong Apple Growers' Union, which controls output of the valley. Same fruit, same markets, same prices as Hood River has. Fine class of people coming in—a community of *homes*. Land close in to river and railroad, $40.00 to $150.00 an acre *now*, but advancing rapidly.

Write, phone or call on

W. F. CASH UNDERWOOD WASHINGTON

White Salmon Valley

WASHINGTON

Across the river from Hood River Valley, Oregon, in the Banner Apple Belt of the World

The WHITE SALMON VALLEY today presents OPPORTUNITIES FOR INVESTMENT beyond that of any other FRUIT REGION in the Northwest. It is the north half of a LARGE VALLEY lying between Mount Adams on the north and Mount Hood on the south. The mighty Columbia flows between and divides this valley. From the Columbia River to Mount Hood forms the Hood River Valley, and from the Columbia River to Mount Adams forms the White Salmon Valley. Both these mountains are snowclad all the year and influence the climatic conditions. This, together with a volcanic ash soil, produces apples that are superior to all others in the world in FLAVOR, SIZE, COLOR, and, most important of all, KEEPING AND SHIPPING QUALITIES.

Ninety per cent of the fruit grown in this valley is exported, bringing the highest market prices.

THE CLIMATE of this region is ideal. It is located in the midst of the CASCADES, with a pure mountain air and free from excessive rains or drouth. The snow-covered peaks at either end of the valley temper the heat of summer and make the summer nights cool and invigorating. The winters are as a rule mild and short. The scenery is as fine as may be found anywhere on the continent.

The valley has been held back heretofore through lack of railroad transportation, but the SPOKANE, PORTLAND & SEATTLE RAILROAD, part of the Hill system, now in operation, gives this valley the best of shipping facilities.

NOW IS THE TIME TO SECURE A CHOICE ORCHARD TRACT AT A LOW FIGURE. Write today for particulars of this wonderful valley to the

WHITE SALMON VALLEY DEVELOPMENT LEAGUE, WHITE SALMON, WASHINGTON

PARTIAL LIST OF **FARMS** For Sale by **WARREN & STATER** LEADING REAL ESTATE BROKERS McMinnville Oregon

FACTS CONCERNING YAMHILL COUNTY

McMinnville is the county seat of Yamhill and is situated thirty-nine miles by rail south of Portland. Boats can run to McMinnville the year round. The city has a population of 3,000, and is well supplied with church and school facilities. The Baptists and Catholics have colleges that are well patronized by the state and county. The country around McMinnville is mostly level, and is well adapted for the raising of grain, fruits, berries or anything else. Transportation to market is the best; eight passenger trains daily pass through the city going north and south. The climate is made mild by the breezes from the Pacific Ocean, which is only forty miles from the city on shortest line. The city has one of the best gravity water systems in the county, supplied by mountain springs, the purest water in the world. There are nine banks in the county, the most important ones being located at McMinnville, with a capital and surplus of $100,000 each, and deposits of nearly one million dollars. The banks receive their business from the agricultural products of the country around here, and have as fine banking houses as there are in the state.

No. 2.—285 acres, 150 in cultivation, balance in pasture and timber, mostly oak, suitable for wood; good buildings, all well fenced; living water; located on good county road, two miles from railroad town; fine lot of good pasture land and a large milk condenser in the town; plenty of fruit. Price $40 per acre.

No. 52.—227 acres, good house and barn, abundance of fruit and berries, all fenced; living creek passes through the place; on county road; 80 acres or more in cultivation; 3 miles from a good, live railroad town; lot of good wood timber on the place, some creek bottom, some rolling land, no poor land on the place; will raise everything. Price $37.50 per acre; a bargain.

No. 62.—$100 per acre will buy 50 or more acres, less than two miles from town, all in cultivation, except very little that has some timber on; all level; fine road to the place; all good land; no buildings. Price $100 per acre.

No. 92.—78 acres, all in cultivation except about 5 acres, which has some timber for wood; all level land; new house, good barn, fruit; no poor land on the place; on county road, three miles to town and railroad station, about a mile to school; well located. Price $7,000.

No. 104.—33 acres, all in cultivation except about two acres; good buildings; watered by wells and river that bounds the place; abundance of fruit of all kinds; well located, less than half mile to where two railroads come together and station; on main county road, 2½ miles to county seat. All for $4,700.

No. 105.—25¾ acres, less than two miles from town or school or college; all level, on good road, good neighborhood; new house, old barn, some fruit, all fenced and cross fenced; well located, easy drive to town. Price $4,000.

No. 113.—12 acres, all in cultivation; fair house and barn; most all set to fruit; 1¼ miles to town; lays off the county road about a quarter of a mile; all rolling land and first class soil. Price $1,700.

No. 142.—65 acres, 55 in cultivation; new house and barn; watered by springs; some timber; less than a mile to school, 5 miles from town; all fenced; rolling land, soil very deep; fine fruit land; land lays good, no wet land on the place. Good for $75 per acre.

No. 158.—158 acres, 125 in cultivation, balance in pasture, fir and oak timber; on good county road; living water, three wells, one at house, one at barn and one in pasture; good house, barn and outbuildings, well fenced; all good land; abundance of fruit of good variety; lays well; 90 acres in clover now and all the place has been in clover; balance is in grain; 6 miles from county seat, 3 miles from another good town where boats come and go every day; school near the place; one of the best and nicest places in the county. Price $100 per acre.

No. 146.—30 acres, with good new house and barn; near boat landing, on county road; fruit of good variety; less than a mile to school and church; all upland and the very best of soil, all fenced, well water; a lovely little place for $2,800.

Also 40 acres in river bottom; has house on the place, 4 acres in walnuts; this river bottom land is considered the best land for all purposes that we have. Price $1,500; or both of these last-named places for $4,000.

No. 165.—113 acres, 60 acres in cultivation, balance in pasture and some timber; nice rolling land, watered by springs; fruit of all kinds; well fenced; good 8-room house in good condition, fine barn; lays off the county road about half a mile; fine dairy farm; good country and people around it; near to school. Price $65 per acre.

No. 220.—135 acres, 130 in cultivation; very best of land, good improvements; fine rock roads; 6 miles from town of 3,500, quarter mile to good school; fruit, spring water piped to house; fine location; everything about to make an ideal home. Price $85 per acre.

No. 236.—23¼ acres, about all in cultivation; good house and barn, abundance of fruit and berries, living water; well located, 2 miles from county seat; well fenced; a fine little place. Price, $5,000.

No. 234.—212 acres, 150 in cultivation; most all river bottom land, fine alfalfa land; fine lot of ash and fir timber; 2 miles to good town, 6 miles to county seat; fair improvements; fine dairy farm; living water; can be divided nicely. Price $12,000.

No. 236a.—133 acres, 75 in cultivation, balance in timber and pasture; nice rolling land; water piped to house and barn, fruit and berries in abundance; 2 miles to good railroad town, with a large milk condenser in the town; good roads, good buildings and fences. Price $8,000.

No. 238.—190 acres, 120 in cultivation, 20 in timber, 50 in stump pasture, all rolling, no waste land; fruit and berries for family use, good fruit land; 30 acres in clover; 2 miles from good live town, with a large milk condenser in town; good school; watered by wells; fair improvements; a lot of stock and machinery goes with the place for $75 per acre.

The prices given are subject to change without notice.

If you want more information concerning this country, especially Yamhill County, we will be glad to correspond with you. We are reliable, and you can depend on what we say. We are well known and would refer you to any business house in the city. Be careful of those that are always lurking around the hotels and depots to catch the stranger. We have an office and invite all strangers to call on us for information before buying. We will be glad to show you the country, and insist on you doing your looking before buying.

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CLIMATE—A desirable medium between the drier eastern and the more moist western conditions of the Northwest.

SOIL—Volcanic ash, rich in phosphates, and recognized as the best in the world for apples and strawberries.

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Cheap and the best of land. Plenty of water for irrigation at low rates. Good transportation facilities. You are cordially invited to see what I have done at my home in six years. I handle these lands.

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DUFUR VALLEY, OREGON

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GOOD FRUIT OR WHEAT LANDS, CHEAP

Opportunities for the orchardist and diversified farmer lie thick in Dufur Valley
Three streams fed by snow from Mt. Hood flow through the Valley

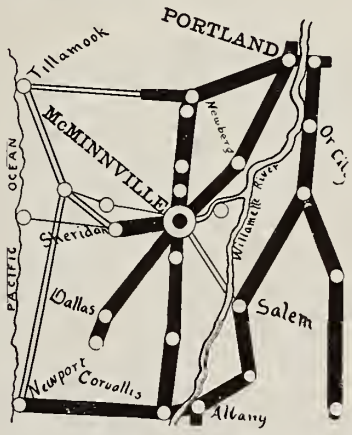
WRITE FOR DESCRIPTIVE BOOKLET TO

DUFUR VALLEY DEVELOPMENT LEAGUE DUFUR, OREGON

McMINNVILLE
OREGON
"THE WALNUT CITY"

Destined to be the Great Clearing Emporium of the Walnut Industry of the Northwest

Seven wealthy syndicates in Portland are now engaged in colonizing Yamhill County by placing small tracts of land on the market, and there is work for seven more as the County will support 125,000 more industrious people; five to ten acres being sufficient to support a family when properly cultivated.



Professor C. I. Lewis, of the State Agricultural College, writes of the walnut industry: "It offers one of the finest fields for investment to be found. From the seventh or eighth year on, the investment will pay good interest on a valuation of $1,000 per acre, and a good bearing grove will easily bring that figure. Yamhill is probably the banner county in this industry."

Luther Burbank writes: "If on deep, well-drained land, you will have in six to eight years a grove of walnuts which will pay at present, or even much lower prices, a most princely interest on your investment."

In order to put the Royal Walnut of this section to the top notch in quality and quantity to the tree, the growers of McMinnville and vicinity have formed a Walnut Club for educational purposes. They employ skilled men and experienced scientists in the study of planting, grafting and cultivating. Membership fee is one dollar, and any grower, anywhere, is eligible. One member of the club, with a twelve-year-old orchard, says: "Some more experience is necessary to get best results. But enough is known from what we have, as well as from the trees that have been bearing here for twenty-five years without a failure, to show that walnut growing here is an absolute certainty."

For fancy walnuts the county will never be surpassed. A Chicago man writes: "Your walnuts are the best I ever tasted. You will never want for a market for such." And this from a New York man: "Is it possible to get your fancy Oregon walnuts in the market here?"

McMinnville is also the City Beautiful, with a Civic Improvement Club, composed of one hundred of our best women, who have made it beautiful and are determined to keep it so. Population 3,700, and growing. Owns water and light plant. Good sewers; finest mountain water, gravity system. Good schools and churches and excellent railroad and river transportation.

Not only in Walnuts, but in all the finest fruits of Oregon, does Yamhill County gather in the grand prizes

Thrice fruited realm with balmy breeze,
Where golden nuggets grow on trees!
Make there a home, if you'd be blest,
And Yamhill soil will do the rest.

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For Information Write to J. C. Cooper, *Secretary*, McMinnville, Oregon

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203.—10 acres, 6 miles out on West Side; no rocks, easily cleared, road to within 20 rods, more or less; about 2 acres tall timber for wood; sightly building spot; soil very deep and good; no improvements other than about 3 acres slashed; irrigating lateral ditch running through highest point. Price $1,700. Easy terms.

215.—10 acres, 2½ miles out on West side; 2 acres 12-year-old Spitzenbergs, Newtowns and Baldwins; 4 acres 6-year-old Spitzenbergs and Newtowns; 100 2 and 3-year-old Newtowns; home orchard of all kinds of small fruits; horse, wagon, hack and harness; all farm tools; good 7-room house, barn, apple house, chicken house, etc.; good well and pump; 7 inches irrigation water, 3 inches free water. Price $10,500. Easy terms.

554.—10 acres, 1½ miles out on West Side; 5 acres 4 and 5-year-old, 3 acres 2 and 3-year-old Spitzenbergs and Newtowns, 1½ acres strawberries, 2½ acres potatoes, 2 acres clover; 8 inches irrigation water; house, barn, sheds, etc. Price $11,000. Easy terms.

556—10 acres, 4 miles out on East Side; 9 acres in trees, principally Spitzenbergs and Newtowns, mostly 7 years old; home orchard of all kinds of small fruits; spring water for house use, 3 inches irrigation water; 5-room house, barn, outbuildings; near school, church, store and railway station; in good neighborhood and the very best of land. Price $15,000. Easy terms.

555.—20 acres, 7½ miles out on East Side; 11 acres cleared, 4½ acres 3-year-olds, 1½ acres 2-year-olds, 5 acres set this spring, all Spitzenbergs and Newtowns; balance of land slashed and burned; ½ acre potatoes, ½ acre corn; good spring. Price $7,000. Easy terms.

533.—10 acres, 7 miles out on East side; ¼-mile to railway station, near school, church and store; 4 acres in 1-year-old Spitzenbergs, Newtowns and Ortleys, balance of land in clover. Price $3,700. Easy terms.

400.—20 acres, 6½ miles out on East Side; 17 acres in 5 and 6-year-old Spitzenbergs, Newtowns and Jonathans; 3 acres alfalfa and garden; good 6-room house with pantry, closets, etc.; 5 inches water stock; all good apple land, on main traveled road, and one of the best places in the valley. Price $20,000. Easy terms.

451—40 acres, 5½ miles out on East Side; 20 acres in orchard, 4 acres 6-year-old, 14 acres 5, 3 and 2-year-old, and 2 acres old orchard, all Spitzenbergs, Newtowns, Ortleys and Jonathans; 200 2-year-old peach fillers; 6 acres in stumps, balance in oak and pine timber; 6-room house, small barn, all farm tools, etc.; near school, church, store and railway station. Price $11,000. Easy terms.

410.—80 acres, 6½ miles out on East Side; 7 acres 14-year-old apples, mixed varieties, 11 acres 6 and 7-year-old Spitzenbergs and Newtowns, 21 acres 2-year-old Spitzenbergs and Newtowns, 5 acres in pears, 18 acres hay, 8 acres uncleared; house, large barn, packing house, chicken house, etc.; large spring, water tower and ram; a money maker for subdividing or developing. Price $40,000. Easy terms.

421.—160 acres, 5 miles south of Mosier; 25 acres in orchard, 7 acres in bearing, all commercial varieties; home orchard of peach, pear, plum, cherry, etc.; loganberries, several grape vines of different varieties, water available for irrigation; small house, barn, winter cellars, chicken house, etc.; 140 acres good apple land; the orchard alone is worth the price asked for the whole, $12,000. Easy terms.

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The Reliable Dealers

DAVIDSON BUILDING HOOD RIVER, OREGON

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FIVE REAL BARGAINS

60 Acres Of as fine apple land as is in this beautiful little valley; 40 acres under cultivation. Splendid commercial orchard of 1,315 trees; almost half of this is in full bearing; balance of the 40 acres in potatoes and meadow; 20 acres in timber, light clearing. Abundance of free water from a trout creek on place. New 5-room California bungalow. On main county road, 3 miles from railroad station. Price is only $15,000; $6,000 cash, and the apples will pay the balance.

27 Acres 22 acres of which is in solid orchard, strictly commercial, being Newtowns and Spitzenbergs, ranging from 1 to 7 years old and all in the very best of condition. A few assorted trees for family use. All kinds of small fruit and berries; 2 acres in potatoes. Seven-room house. In the best orchard district on the east side. Price $18,000; $5,000 cash will handle it.

20 Acres 16 acres in prime 4-year-old, strictly commercial orchard; 30 trees 10-year-old family orchard; 2 acres in meadow, balance in timber; creek; good 7-room house, horses, harness, wagon, all implements and tools go with the place. Splendid location, only 4 miles out. Price $11,500; $5,000 cash.

10 Acres Ideally located on two roads, right in the heart of the valley. Free water from a trout creek on place. Commercial orchard of 532 trees, 2 and 4 years old; 1½ acres in strawberries between the rows; balance in onions, garden, etc. Five-room house. Price $6,000; half cash.

FOUR-YEAR-OLD APPLE ORCHARD IN HOOD RIVER VALLEY

34 Acres Volcanic ash soil; 10 acres in young commercial orchard of Newtowns and Spitzenbergs in prime condition. Only 3½ miles from the depot at Mosier. This is the biggest snap ever offered in this famous little valley for $3,500; $1,000 cash.

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BETTER FRUIT

A MONTHLY ILLUSTRATED MAGAZINE PUBLISHED IN THE INTEREST OF MODERN AND PROGRESSIVE FRUIT GROWING AND MARKETING

NOTES ON THE WALNUT AND ITS PROPAGATION

BY C. I. LEWIS, HORTICULTURIST EXPERIMENT STATION CORVALLIS, OREGON

IT has been thoroughly demonstrated that the English walnut can be successfully grown in Oregon and other parts of the Pacific Northwest. This statement needs little proof. It has passed the experimental stage. We have the bearing trees as a living example. But there are many questions concerning walnut culture that are in the experimental stage. Problems concerning the adaptability of certain soils, the best stocks to use, the special adaptation of these stocks to our soils, more successful methods of grafting, the originating of improved varieties—all are problems worthy of investigation and study. The loss to young trees last fall and winter was especially heavy and has discouraged many people and caused some to predict that the walnut with us is a failure. But I only need add that the unprecedentedly heavy fall frosts also injured and killed many young fruit trees. Yet we are not at all discouraged from the fruit point of view. The presence of walnut trees of all ages, from two to twenty-five years, demonstrates that the past year has been very unseasonable. There is never any great loss without some small gain, and the gain in this case is that it has taught many people that great care must be exerted in selecting walnut trees. The early walnuts were caught in the past spring by the frosts, whereas the late blooming and growing French varieties have demonstrated their adaptability to our conditions. Unfortunately for the industry, we might state that the walnut is in the bonanza stage. Many large tracts are being planted. In some cases absolutely no knowledge is shown of the requirements of the tree, little or no care being given in the selection of the proper strains. Extravagant, ridiculous stories are circulated concerning the profits to be realized. Much of this false advertising is sure to come back like a boomerang. It can be truly said that the walnut offers a good field for investment and at the present time promises to pay a fair return on the capital involved. It may never reach the extreme figures occasionally realized from our orchards, but is very apt to be a business that will be very staple.

Propagation—The subject of propagation of the walnut has given rise to much difference of opinion, and it will evidently be some time before the matter is thoroughly settled. We seem to be going through exactly the same evolution and experiences that have been involved in the pecan industry. One of the main points of discussion is, Which are preferable—grafted or seedling trees? Let us consider the seedling tree first. There are men who claim that these are superior to grafted trees, especially in size, prolificness, etc.; that there is something about our wonderful Oregon climate that causes the so-called second generation trees to bear larger and better fruits than the parent plant. And these writers love to dwell on the subject of generation. There is at times a sort of mystery, an uncanny vagueness, connected with this subject, that is baffling and bewildering to the layman, and causes him to listen with mouth agape. It is the same sweet silly story that we have had to learn by bitter experience with other nuts and fruits, and some of us will evidently pay dearly for it in the case of the walnut. The term "first generation" is generally applied to the parent tree—some say the original tree, while others put the clause on, the original grafted tree. Nuts taken from such trees and planted produce the second generation trees. These may be equal, may be superior, or may be inferior to the original stock. It is this very variation and unstability that makes the seedling to a more or less degree a gambling proposition. The walnut seems to bear out fully the laws of plant breeding, and whenever new blood is introduced you must look for a variation, and the more foreign blood, the more crosses that are made, the greater will be the variation. So that one would naturally look for very much less variation in a so-called "second generation tree" than in a third, fourth or fifth generation, where crosses from other varieties had taken place. To write fully on this subject I would need to use up

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THE WALNUT GROWING INDUSTRY IN FRANCE

WALNUT CULTURE—GROWING, CULTIVATING, ETC.

WALNUT GROWING IN NORTHWEST DISTRICTS

TREATISE ON POLLINATION OF APPLE BLOSSOMS

Continued from July Edition

PLATE I.—TOOLS USED IN WALNUT GRAFTING

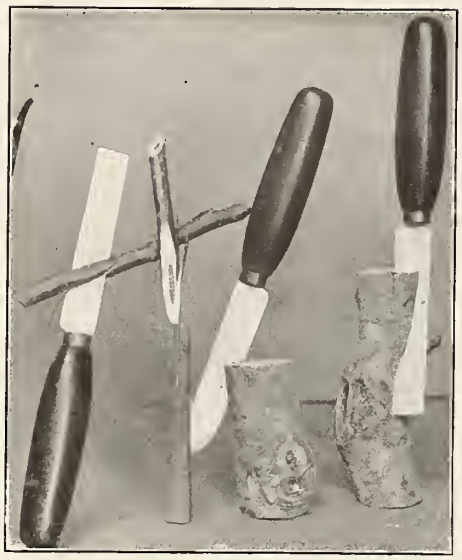


PLATE II.—METHOD OF MAKING NURSERY GRAFTS: (1) FIRST CUT ON SCION. (2) SECOND CUT ON SCION. (3) FIRST CUT ON STUB. (4) SECOND CUT ON STUB

all the space of this article, and as there are other important points I wish to touch on, I must leave it. In summing up the seedling walnut, I would state, that while variation will take place, it will not, for various reasons, be as marked as in the case of some fruits. Under certain conditions a fair amount of success can be expected, and we will probably have some very valuable seedling orchards in our state; others, on the other hand, will be very disappointing. One of the principal points in favor of the seedling tree is that they are easy to procure and are much cheaper than grafted trees. With proper selection, from twenty-five per cent to seventy-five per cent will produce good commercial nuts. Your expectation must not be, however, that these will be uniform. If you use the seedling, be sure that the nuts were taken from an orchard of one variety, or from isolated trees. Where cross-pollination is allowed to take place you must expect some variation in the progeny. Plate VIII shows two nuts from grafted trees. One of these is the Franquette and the other is a Mayette-shaped Proeparturien. These are shown in the center of the photograph. The four nuts shown on the top and bottom of the photograph, were gathered from seedlings of these two parent nuts. The deterioration in this case is very marked. The Franquette seems to be a variety which, when properly selected, gives a large percentage of nuts true to type. Unfortunately, many seedling trees are put on the market for which the seeds were procured from grocery stores or other unreliable sources.

If we are to get the highest results from walnut growing, we must procure grafted trees, and be careful also in the selection of these, for there are many worthless grafted trees being advertised. A grafted tree, to be really valuable, should be the result of a scion properly selected from a high grade commercial nut grafted onto a strong vigorous stock. Such trees are easily worth $1.50, which is charged for them, and they are very hard to obtain at this price. The scarcity of grafted trees is very unfortunate. Trees worked as above described make strong vigorous trees which bear fruit like the parent, and the returns from such an orchard would naturally be greater than from mixed, heterogeneous nuts. There are many problems concerning the grafted tree. One of these is the selection of stock. There are three kinds being used at the present time in Oregon: first, the English, which has the drawback of being rather expensive and of comparatively slow growth; second, the California Black, which is easy to germinate, gives a fairly large percentage of successful unions, and gives a uniform lot of trees. We have California Black trees scattered over western Oregon and along the Columbia as far as Mosier. Some have questioned their hardiness, but at present they seem to be hardy, though possibly not as much so as the American Black. The third stock is the American Black. It is rather hard to germinate, does not give as uniform a lot of seedlings, but is a splendid, vigorous-growing tree. Both the American Black and the California Black may succeed on soils not adapted to the English stock. We shall need a few years to experiment further on this subject. The Oregon Experiment Station is conducting some experiments along this line. The percentage of successful grafts in the nursery row is very low. This accounts for the high

PLATE IV.—(1) GOOD SCION WOOD. (2) POOR SCION WOOD. (3) SIDE VIEW OF SCION FOR CLEFT GRAFTING. (4) BACK VIEW. (5) FRONT VIEW

price of grafted nursery stock. It is much easier to top-work successfully trees five years old and more, than it is to graft nursery stock. For this reason the best plan for many people who cannot procure grafted stock, will be to plant selected seedlings more closely together than would be desired for permanent planting, and after the trees come into bearing have some of the less desirable ones worked over. However, there will probably be some trees that come into activity so very early in the spring and some that come so very late that it is doubtful if it will pay to try to top-work them. But, all in all, one should expect to be able to obtain sufficient trees that will graft easily, together with the better seedlings, to make a very satisfactory orchard. Since there is so much interest in the grafting, I have decided in this article to give in more or less detail some of the more successful methods employed today, and especially those employed by Mr. George Payne, of Campbell, California, who has done some very satisfactory work in our state.

Nursery Practice—The nuts may be handled in various ways. The black walnuts can be planted in nursery furrows in the fall, or they may be layered in boxes, as is commonly practiced with English nuts. But personally I prefer the spring planting. Choose the sunny south side of a building. Lay down a couple of two by four strips. Upon these lay a loose board platform. Put on an inch of sand, then cover with a layer of nuts, which are in turn covered by sand, damp moss, or wet blankets.

PLATE III.—(1) END VIEW OF STUB AND SCION. (2) SIDE VIEW. (3) SCION SET AND TIED. (4) STUB WAXED. (5) STUB BAGGED

In case of heavy rains lay over a few boards to prevent washing. Nuts planted in this way in March will soon sprout and can then be planted in the nursery row. Be sure to have the ground very thoroughly prepared, as these shoots are as tender as young asparagus and the working of lumpy soil will destroy many of them. I would always advocate the planting of these trees in a nursery row, for one can plant enough trees in a very small area for a planting of a hundred acres, and thus can give them intensive, inexpensive care, much more so than if they were planted in a

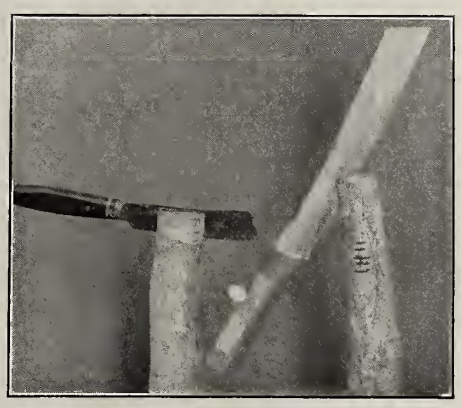


Plate V.—SPLITTING STUB FOR CLEFT GRAFTING

hundred-acre field. The trees should be given intensive cultivation, as is practiced with other nursery stock. If properly cared for, a large percentage will be large enough to graft the following spring.

Nursery Grafting—The first thing is the proper selection of tools. These are shown in Plate 1. Some of the tools in this photograph, however, are designed for cleft grafting. For nursery grafting we need a good pair of band shears and some good budding knives, such as the Joseph Rogers, the IXL or the Henkle. A knife that can be used to advantage also, is a shoemaker's knife. This is generally cut to a square end. To do successful grafting one must have sharp tools. A good way to keep knives sharp is to prepare yourself with a narrow strip of board, on one side of which is tacked a leather strap and on the other is sprinkled some oil and emery. A few strokes will keep the knife in good condition. Where much work is to be done, one should provide himself with several knives. Special wax is necessary, and in order to keep this warm it is necessary to provide oneself with some kind of a lamp. The one shown in the cut is made of sheet iron, has a pot on top for holding wax, an alcohol lamp underneath for providing heat. It works very satisfactorily indeed.

It is very important that one use great care in selecting scion wood. Choose only last year's growth, selecting round wood with buds not too far apart. Where the buds are too far apart the wood is apt to be very pithy. A plumpness around the bud is a good indication. Be sure to select the upright growing wood, rejecting those long sprouts that tend to grow downward, as these have a tendency to produce unfruitful trees, and might result also in a weeping, sprawling tree. The spurs that are a foot and more in length make good material. The terminal buds generally are too soft to be successfully handled. Plate IV shows good and poor scion wood. It is absolutely essential in walnut grafting that the scions be kept absolutely dormant. If the buds are allowed to swell no success can be expected. This means that they should be cut two or three weeks previous to the time of grafting, and that would be from the last of March to the first of April. Where choice wood is very expensive it will pay you to keep these scions in wet moss or other damp material and place them on ice until ready for use. Care should be taken not to allow the scions to decay or dry. It is better to cut the scion wood into lengths of twelve or fourteen inches, as it keeps better than the short scions. A good way to keep them is to layer them firmly in sand. Where it is impossible to keep on ice, put in a cool cellar or basement. As the walnut is a very pithy, dry wood, one should wait until a good flow of sap starts before attempting to graft. English stock can be grafted a little earlier than the Black. The swelling buds are always a good indication of the flow of the sap. The Black walnuts will permit a longer grafting period than the English, even being successfully worked when two to five leaves are formed by the end of the twigs. The peeling of the bark is a fair sign for the proper time for grafting nursery stock. If put off too late the bleeding may become somewhat serious. Here, in western Oregon, the proper time of grafting would be about the middle of April. It varies somewhat with season.

In grafting nursery stock it is preferable to do the work during the middle hours of the day, for in the early morning and also in periods following rain

Plate VII.—OLD WALNUT TREE TOP WORKED

the bleeding is apt to be excessive. First kick away the dirt from around the tree and then cut off with a sharp band shear, holding the blade downward, at a point about two inches above the ground. We are now ready to prepare the stock. There are several methods that can be used, but one of the most successful ones is that in which a triangular piece is cut out of the stock, the angle formed in the stock being a right angle. Plate II illustrates the method of cutting a scion and stock. Take a sharp shoemaker's knife and make a cut from an inch to an inch and

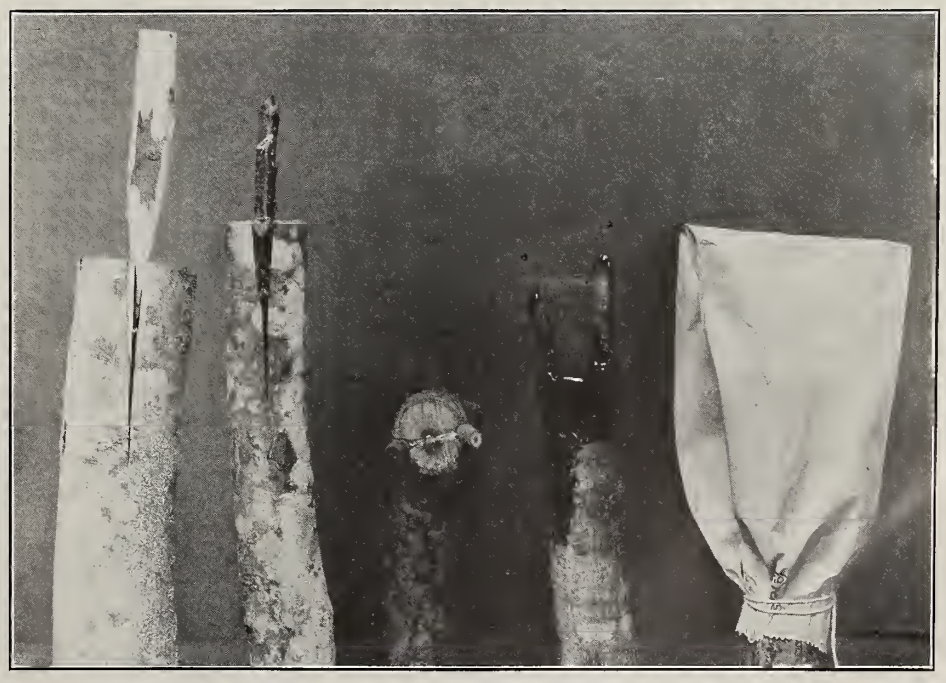


Plate VI.—(1) STUB OPENED AND CUT TO FIT THE SCION. (2) SCION SET. (3) END VIEW OF STUB, SHOWING PAPER IN CLEFT. (4) STUB WAXED. (5) STUB BAGGED

a half long. This cut commences at practically nothing at the point and deepens as it reaches the top of the stock. Then turn the knife at right angles to the first cut, cutting deep in the center to nothing at the lower end. Choose a good scion and then make a cut about an inch long, making a draw cut. Make the second cut at right angles to this, as shown in Plate II. We generally prepare the scion before we prepare the stock, the stock being cut to fit the scion rather than the reverse. Great care must be taken to have the cuts absolutely smooth. Unless the union is exact, very little success will be realized. Set the scion well up on the stock, so that the angles of the two fit exactly at the corner. This means that some of the cut portion of the scion will be visible above the stock. Now tie firmly with cotton twine and wax over carefully. The waxing is very important. You should strive to seal the graft hermetically. This will mean waxing two or three times, possibly four times. Also put some wax on the top of your scion. Now cover with a paper bag, tying it securely at the base. These operations are nicely illustrated in Plates II and III. The bag should be tied in such a way as to leave space enough above the top of the stock for the scion to grow an inch or so. The bags are left on from a week to two weeks, according to season, and until the scions are making a good growth. Then tear away the bag on the north side, and after two or three days remove it entirely. Choose, if possible, a dull day for this work. After the grafting is done, replace the dirt around the tree. The wax is made from the following formula: Rosin, 5 pounds; beeswax, 1 pound; finely pulverized charcoal, ½ pound; raw linseed oil, 1 gill. Be sure that the charcoal is very finely pulverized. First melt the beeswax and rosin, being careful not to have the fire too hot. Add the charcoal, stirring constantly, and then add oil. Pour into greased pans. When desiring to use, break out a few lumps and melt it in such a contrivance as shown in Plate I. The wax must be perfectly liquid, if applied successfully.

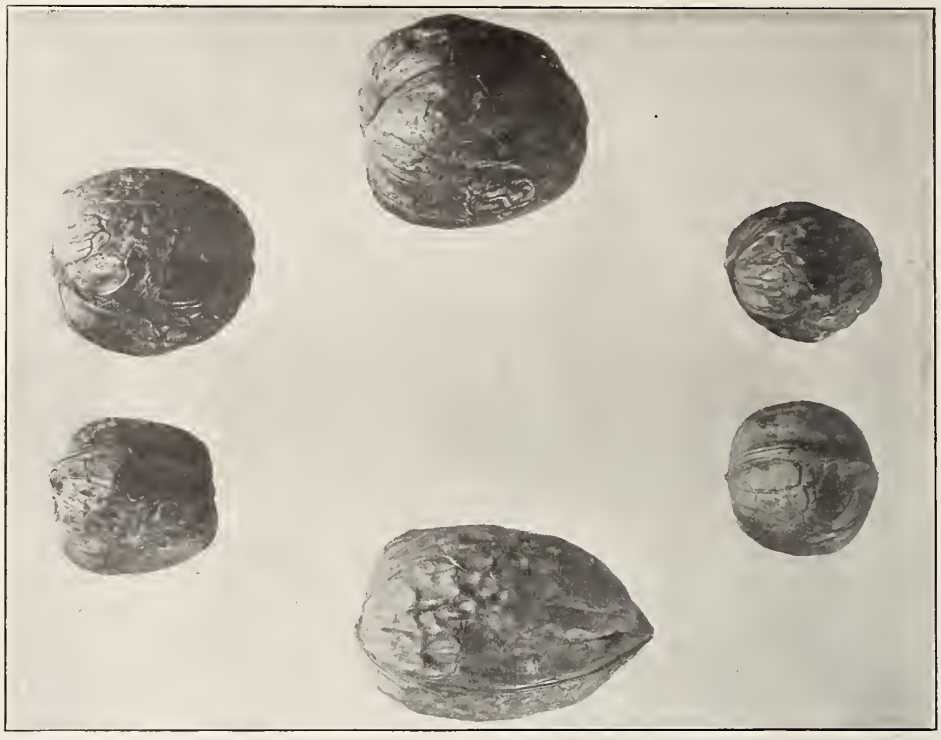


Plate VIII.—WALNUTS, SHOWING PARENTS IN CENTER AND OFFSPRING ON EITHER SIDE

Courtesy Oregon Agricultural College

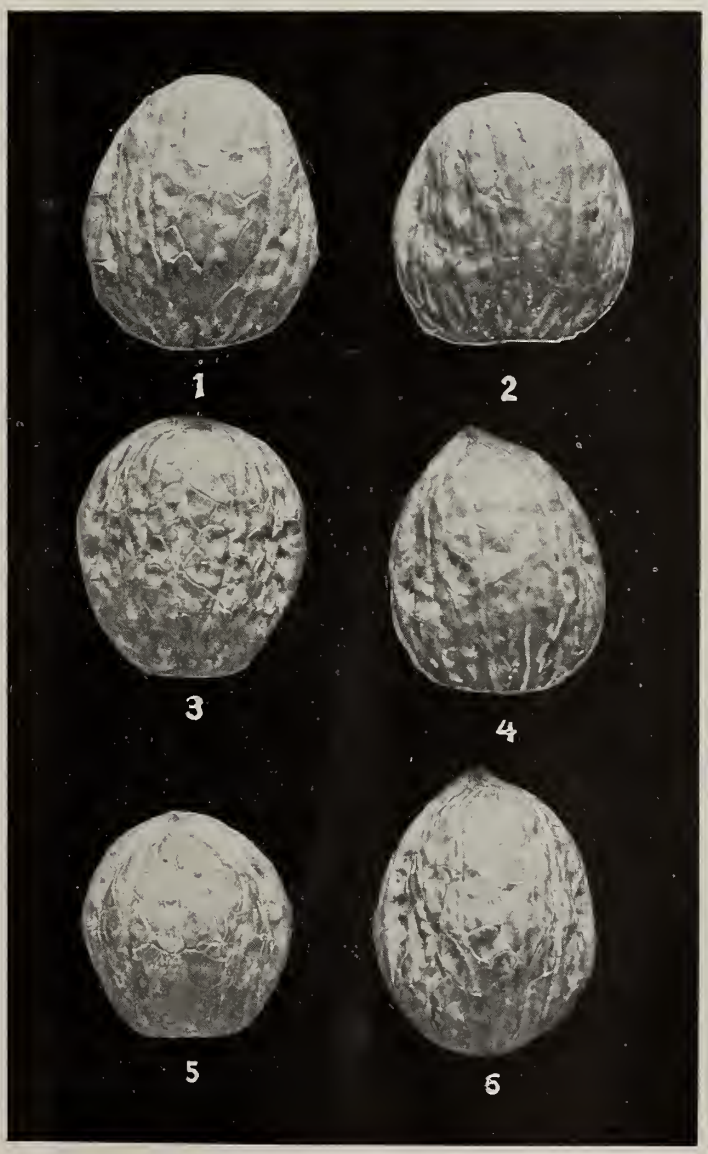
1 ENGLISH WALNUT (*Juglans regia*) 2 AMERICAN BLACK WALNUT (*Juglans nigra*)

Top-Working — Unfortunately, the percentage of successful grafts in nursery work is very small, often not greater than 10 per cent and very rarely exceeding 50 per cent. However, top-working is more successful and under favorable conditions the percentage at times runs into the nineties. The system of top-working that I will describe is a slightly modified cleft graft. A few additional tools will be needed, as shown in Plate I. A double-edged saw or a California saw, a set of butcher knives of varying length and thickness, to be used for splitting stock, a set of hardwood wedges about six inches in length and of varying widths, for different sized stocks, a splitting mall made somewhat after the style of the old-fashioned potato masher, and a good supply of old newspapers for filling in the chinks. As in nursery grafting, we cut the stock to fit the scion. Since the walnut contains so much pith it is quite evident that one cannot cut the wedge-shaped scions so often used in apple grafting. Plate IV, Figures 4 and 5, shows a scion properly cut for cleft grafting. Choose a scion with about two buds and cut off about two and one-half inches below the buds, making a slanting cut. Turn the scion so that the lower bud is upward. Start your cut with the knife nearly opposite or a little lower than the bud. At first simply draw the knife beneath the bark and as you come towards the point of the scion continue cutting gradually deeper. When the knife has passed about two-thirds the length, suddenly draw it in, making a sharp angle, as shown in Plate IV, Figures 3, 4 and 5. In choosing your branches for top-working, saw off the branches horizontally, preferably where the diameters would not be less than two inches nor greater than four. Choose a place for cutting where the branch is smooth and free from knots, so as not to interfere with splitting. Now take a butcher knife and place on top of stock and hit it lightly with the mall, splitting it through the center. Do not make this cut very deep. Figure 1, Plate V, shows the proper amount for the first cut. Now bear down heavily on the handle of the knife and tap lightly, as shown in Figure 2, Plate V. Remove the knife and make the side cut on the opposite side of stock. Drive in the wedge to open the cleft. Take a shoemaker's knife and pare away portions of the bark, so that the scion and stock will fit perfectly. After the two scions are placed, pull out

the wedge and fill in the crack with newspaper, wax over carefully, and protect with paper bag as for nursery grafting. These operations are all shown in Plate VI. It is generally considered advisable not to remove all the branches from a tree in one season, but leave one or two to carry off the excess sap. The success of walnut grafting depends on the proper time, careful clean cutting, perfect fitting and careful waxing. There are other more or less successful methods of grafting, but I believe the ones I have described are superior. Budding is sometimes resorted to—shield and flute budding being the more common. Very little wood is left under the bud, and the petiole of the leaf is left intact until it naturally shrivels off. This is better than cutting off, as it reduces the evaporation. In top-working the large trees a few buds are occasionally allowed to start beneath the graft, so that in case the scion does not grow an old dead stub is not left as a result. As soon as the scions start all such buds are removed. The grafts are never pruned, but allowed to grow at will unless the trees are very high, in which case the grafts are occasionally pruned. The method described can be used in top-working many of our California Black and American Black walnuts over to choice English varieties.

The proper site for a walnut orchard is an important subject for us to consider. It used to be said in Southern California that the walnut did not succeed beyond the sound of the ocean, and it is true today that the walnut sections are principally in the coast counties. There is a possibility, however, that the French strains have a greater adaptability, and reports are coming that some of the interior sections of California are producing the French varieties quite successfully. In Oregon, at the present time, the walnut industry is confined principally to western and southern Oregon west of the Cascade Mountains. Here the leading French varieties are growing with promise. It may be that portions of the Inland Empire will later on demonstrate their adaptability to growing walnuts successfully. From time to time reports are heard that trees are growing successfully in sections of the Snake River Valley. We have undoubtedly much to learn in regard to elevation, soils, etc., for the walnut in Oregon. At present, the best advice seems to be to choose the deep rolling red hill lands. These have an elevation that insures them against frosts, and many of them contain deep, rich, moist soil. However, some of the red hill lands are shallow and are underlaid with soapstone. In choosing soil, I should seek for a depth of from six to ten feet of good soil. There is a possibility that some soils that we at present think it unwise to plant to walnuts may be used successfully later on for such purposes. Regions that are free from frost, that will naturally grow California or American Black trees successfully, should grow these trees just as successfully when top-worked with English walnuts.

Before planting walnuts, the ground should be carefully prepared, as for planting a fruit orchard. Deep plowing and harrowing and thorough preparation should be given. Grafted trees should be set from fifty to sixty-five feet apart, and seedlings from thirty-five to fifty. Some men, before removing the walnut trees from the nursery in the spring, cut the tap root with a long spade the previous fall. Before setting



Courtesy Oregon Agricultural College

1 MAYETTE 2 MEYLAN 3 PARISIENNE 4 PARRY 5 CHABERTE 6 FRANQUETTE (NATURAL SIZE)

the tree, see that the tap root is cut off smooth and that no torn or ragged wounds are left. It used to be thought fatal to cut a tap root, but we now know better. A few California growers are practising cutting the top back to about two or three buds. However, this is generally done where it is hoped to obtain a little scion wood. I should set the trees in the spring and should obtain the two-year-old trees, that is, one year from the graft. Some growers in California have transplanted trees five and six years old successfully, and I have planted trees even older than this successfully here in Corvallis, but for general commercial purposes would recommend the planting of strong two-year-old trees. In setting your trees be sure to set them firmly and place them about two inches deeper than they were in the nursery row. Give your orchard good care. Intensive cultivation pays as well with walnuts as it does with apples. Don't be misled by the man who continually and lovingly refers to Nature. I fear this same man would object in many cases to eating Nature's products. There may be a possibility that after walnut trees reach a good size the ground may be sowed to clover and may be sheep pastured, but experiments will have to demonstrate the feasibility of this practice. While the trees are young, and especially in cases where grafted trees are planted at great distances, intercropping will be profitable. Vegetables, small fruits, etc., would be the best crops to grow. In this work be careful not to get such crops so close to the trees as to sap their vitality. The ground can be enriched by plowing in crops of vetch, clover, etc.

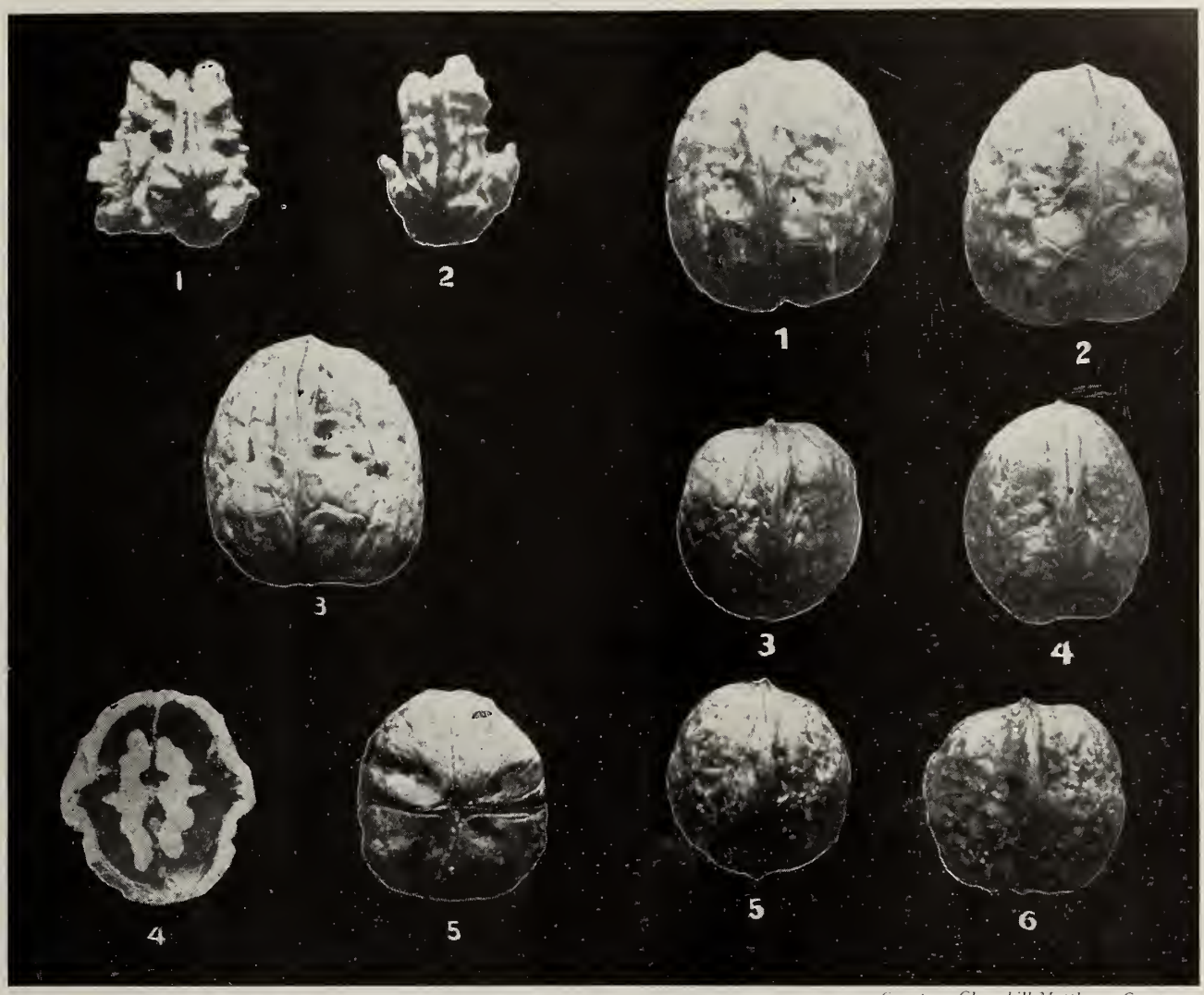
It is the custom to grow the walnuts to a whip the first three years, keeping all laterals removed. The head is then formed from six to seven feet from the ground, by allowing the laterals to grow at this point and not by heading in the terminal. Of late there is a practice in California which seems to be increasing in popularity. This consists in allowing the laterals to form at about four feet from the ground and tying up the lower branches for the first year or two to prevent their drooping. This practice certainly sounds worthy of trial. Mature walnut trees will need little or no pruning, and wherever it is practised the wounds should always be carefully protected by paints.

Thus far we have had no troublesome pests nor fungous diseases to contend with. The dreaded bacterial disease quite common in Southern California, which is commonly called bacteriosis, is found in a few cases over the state. Under our climatic conditions and with French varieties, there is a possibility that this disease may never become serious; on the other hand, there is a possibility that with the development of large commercial orchards we may have to contend with this disease.

The subject of varieties is certainly an interesting one. The reader must understand clearly that there are two strains or distinct types. One of these we often term the soft shell. It is the principal type now grown in Southern California, being first introduced by the Spanish fathers from Spain and other warm countries bordering the Mediterranean. It seems to be unsuited to the United States except in Southern California. In the Pacific Northwest it is worthless, as it starts into growth so early in the

Courtesy Churchill-Matthews Company

1-2 OREGON FRANQUETTE 3-4 IMPORTED FRANQUETTE 5-6 OREGON SEEDLING, PROBABLY FROM FRANQUETTE
(Natural size)



Courtesy Churchill-Matthews Company

1-2-3 OREGON MAYETTE 4-5 IMPORTED MAYETTE 1-2 OREGON MAYETTE 3-4 IMPORTED MAYETTE 5-6 OREGON SEEDLING

spring that it is invariably caught by the frost. The second strain we speak of as the French. These are much hardier than the first type and are growing very successfully in the region around Grenoble, France, where the climate is much more severe than the average conditions in the Pacific Northwest. These varieties are very hardy, standing severe winter conditions and starting into growth so late in the spring as to escape all danger from frost. At the present time in California there is great interest being taken in the French varieties, and it is probably only a short time before their acreage will surpass that of the soft shelled types. Their hardiness, productivity and superior qualities are attracting great attention. It is the French strain that we should grow to the exclusion of all others. As to the special varieties, I would state that the requirements are somewhat exacting. The trees should be hardy and prolific, producing nuts of good commercial size with a shell of medium thickness, tightly sealed. The meat should fill the shell, should be covered with a light pelicle, and should outweigh the shells. Undoubtedly the two best varieties that we are growing today are the Franquette and the Mayette. The Proeparturien, while being very small, is of superior quality, comes into bearing young, and is prolific. It is a very good home nut. Chaberte is perhaps the hardiest nut of all and is adapted for the higher altitudes. There are several other nuts of considerable merit. The Meylan is a beautiful nut, but shows signs of being a light bearer. The Parisienne is likewise a nut of good grade but of light bearing character. The Lanfray shows considerable promise but needs further trial. There are three California varieties of considerable promise, which should do well in Southern Oregon and possibly in other sections—the Payne, which is in some ways a superior Franquette, deserves conservative trial; the Santa Rosa, a nut of good quality but great variability, and the Concord, a nut being considerably advertised, but whose merits I am unacquainted with. The large varieties, like Gant, Bijou and Ford's Mammoth, should not be grown commercially.

As soon as the husks begin to open in October the crop should be harvested. Many of the nuts can be knocked down with light bamboo poles. This practice, however, is questionable. Another way is to jar the branches with mallets, which should be protected in such a way as to prevent injury to the tree. The nuts should be gathered and freed from all adhering husks as soon as possible, to prevent discoloration. They should then be washed. The prune dippers can be used to advantage, or wire gauze drums which rotate in vats of water, or any other mechanical contrivance that will allow the passage of clean water among the nuts. You are now ready for the drying. This can be done on prune trays out in the open sun, but in case of rainy weather prune dryers can be used to good advantage. One should guard against using too much heat, as it will melt the oil and develop harsh, unpleasant qualities in the nut. Probably one should never use over 100 degrees. The length of time necessary for drying, amount of heat, etc., are problems which still need considerable experimenting upon before they will be solved. After drying, the nuts are to be watched for several weeks, as occasionally they need redrying. Before placing on the market they should be carefully graded, both as to size and quality. With the develop-

ALMOND TREES IN THE IMBRIE ORCHARD, GOODNOE HILLS, WASHINGTON

ment of our orchards mechanical graders can be introduced. The crop is generally sold in burlap sacks, but probably the higher grades can be marketed to advantage in pasteboard cartons. While it is true that in California bleaching and dipping are practiced before placing the nuts on the market, I would not advocate that plan here, as it is doubtful if this can be done without injuring the quality of the nuts. Recently the nut growers in the vicinity of Grenoble, France, have organized, in order to improve their methods of marketing the crop. This means that we Americans must be up and doing, for heretofore some of the French growers have been very careless in grading and marketing.

In conclusion I would state that there is practically no danger of overdoing the walnut market, the demand being much greater than the supply. We are depending more and more upon imported nuts. While the profits are perhaps not so great as in some lines of fruit growing, from $75 to $200 per acre could be realized, and the carefully selected, grafted orchard should exceed these figures. Again, the walnut is not as costly a crop to produce. Pruning, thinning, spraying are practically unnecessary, while the harvesting and marketing are less expensive than for fruits, thus materially decreasing cost of production. These are all points which the prospective walnut grower should take into consideration.

FINE SPECIMEN OF ENGLISH WALNUT TREE IN LINN COUNTY, OREGON

NUT GROWING INDUSTRY IN THE NORTHWEST

BY FRANK W. POWER, SECRETARY STATE HORTICULTURAL SOCIETY AND MANAGER EAST GOODNOE NUTLAND CO., PORTLAND

THE most neglected branch of horticulture in the United States at present, and the one offering the greatest possibilities for the future in the Northwest, is nut growing, and

F. W. POWER
Formerly of the Oregon Nursery, now in charge of the orchard department of The Jacobs-Stine Company, Portland, Oregon, and secretary and manager of the East Goodnoe Nutland Hills, Washington, and also associated with the Riverside Orchard Company.

especially of walnuts in the Willamette Valley, Oregon, and almonds on the north bank of the Columbia River in Washington.

Our population of 87,000,000 are yearly becoming greater nut consumers. In place of being considered a luxury, to be used only on special occasions, or consumed by the rich, nuts are fast becoming a regular article of vegetarian diet, and broken kernels are all used in various breakfast foods and vegetarian preparations. The consumption of nuts is increasing rapidly, while the acreage being planted is not nearly keeping pace. In 1905 86,238,000 pounds of nuts were imported into the United States. Every year we consume over 22,000,000 pounds of almonds, of which 15,000,000 pounds to 18,000,000 pounds are imported, notwithstanding a duty of four cents on unshelled and six cents on shelled almonds. In 1905 California, the principal walnut and almond center, produced but 4,250,000 pounds of almonds, and the average yearly crop for the past eight years in that state has been about 3,836,250 pounds, and the average production of walnuts during the same period about 13,080,000 pounds. Does this look as if the industry was being overdone, or that there was any possibility of it being overdone in this country?

Until very recently California produced virtually all the walnuts and almonds in the United States, but there is no reason why all the almonds and walnuts consumed in this country should not be grown here.

Walnuts

While a few English walnuts (Juglans regia) have been grown at various points in the Northwest for many years, the first real "boom" occurred after the Lewis and Clark Exposition. Among the first to plant English walnuts in a commercial way were Mr. Quarenberg, and Mr. Biddle of Vancouver. Mr. Prince of Dundee was about the first to plant a commercial orchard in the Willamette Valley, and it was his exhibit at the Lewis and Clark Exposition, followed by heavy advertising of various nurserymen and walnut departments in the horticultural papers, that brought the fact before the public that a profitable industry had been long neglected. As is always the case in a "boom," many acres will be planted that are not at all suited to walnut growing, and poor commercial varieties or those not adapted to our climate will be set out, only to have to be dug up later on, to the detriment of the industry.

I believe, however, that with care in the selection of soil, location and variety of nuts, the industry of nut growing will be one of the most profitable.

I will not attempt in this paper to go into the details as to the merits of the various methods of planting, whether to plant the seeds where the trees will stand in the orchard rows, or to plant seedling trees or grafted or budded stock, further than to say that if you have the money, and can secure the trees, by all means plant trees that have been grafted from a known French variety and of first-class quality, as grafted or budded stock always comes true to the parent stock.

In planting seedlings still more care is needed, as trees raised from a seed will not necessarily come true, in fact, they usually do not if there has been any

TEN-YEAR-OLD WALNUT TREE IN DOORYARD OF E. C. APPERSON, McMINNVILLE, OREGON

chance at cross fertilization. To secure good seedling trees, select your seed from an isolated grafted tree or an isolated grafted orchard of known variety, as a grafted tree may have been grafted from a hybrid. If more than one variety is in the orchard cross fertiliza-

YAMHILL COUNTY WALNUT EXHIBIT, McMINNVILLE, OREGON, "THE WALNUT CITY"

ALMOND TREES ON GOODNOE HILLS

tion will occur, and if the trees were not grafted and of a known variety, they may be hybrids and not breed true. Great care must be exercised with imported French nuts to know that they are from isolated orchards of only one variety, or your trees may all prove to be hybrids. Do not plant any but late blooming French varieties; avoid the soft-shell varieties of Southern California, as our more northern climate is not adapted to such tender varieties.

Walnuts are found at various points from Ashland north. The largest bearing orchard is owned by Thomas Prince at Dundee, although there are smaller orchards in the neighborhood of Hillsboro, McMinnville, Jefferson, Salem, Albany, Shedd, Jacksonville, Grants Pass, Vancouver, etc. Large plantings are being made at various points west of the Cascade Mountains. Yamhill County, Oregon, is probably planting more than any other section, and McMinnville is known as the "Walnut City," and has its walnut association.

Grafted Trees—Scions can be grafted on their own stock (Juglans regia), or on the American Black (J. nigra), or on the California Black (J. Californica). They may be either grafted or budded, but both processes are difficult and only a small percentage of grafted trees are usually secured, even by the most expert. This makes them expensive. An old theory is that it is disastrous to cut or break the tap root, but I have never found any proof of this, either in transplanting seedling trees in the nursery or seedling or grafted trees in the orchard; in fact, it generally induces new tap roots and appears to produce even a better and healthier root growth, but where the tap root of a walnut or any other tree is broken or bruised in digging, make a clean cut with a sharp knife before planting.

ALMOND TREES IN FULL BLOOM, A PROMISE OF A GOOD CROP, ON NORTH BANK OF COLUMBIA, KLICKITAT COUNTY, WASHINGTON

A WALNUT GROVE IN YAMHILL COUNTY, ADJOINING TRACT OF CHURCHILL-MATTHEWS COMPANY

Distance for Planting—Fifty to sixty feet is the proper distance for planting, and even seventy feet is not too far apart after they reach maturity. In California they find that most of the trees were planted too close and now have to remove a part of them. Little pruning is required after the first four or five years, though care should be exercised up to that time to keep laterals removed, which will cause rapid terminal growth, and seven or eight feet is not too high to head a walnut, as it is inclined to droop, and cultivation is rendered difficult if the tree is headed too low.

Harvesting the Nuts—The nuts are allowed to remain on the tree until fully ripe, when the husks will split open, allowing the nuts to fall. This can be hastened by shaking the tree or striking the nuts with a light bamboo rod. It will be necessary to go over the trees several times, as the nuts do not all ripen at one time.

Custom seems to require bleaching of the nuts. This is often done by exposing them to sulphur fumes, although this injures the quality of the nuts. A better plan, if bleaching is done, is to use a solution of about fifty gallons of water, six pounds bleaching powder and twelve pounds sal soda. After dipping in the solution they are washed with pure water and again dipped in a one per cent solution of bisulphide of lime, and again rinsed and dried.

The nuts in Southern California are usually cured by drying in the sun, but in Central California and in Oregon and Washington they are often cured by being placed in prune dryers, or similar dryers, at a heat of 100 to 130 degrees Fahrenheit.

Market for Walnuts—In 1903 California produced 11,000,000 pounds of walnuts, and we imported over 12,000,000 pounds. By 1905 the production in California had increased to 11,500,000 pounds and we imported over 21,000,000 pounds, and the ratio holds about the same now. In other words, our rate of consumption of all kinds of nuts is increasing much faster than our increase in yield, and importations, in place of decreasing, have actually increased.

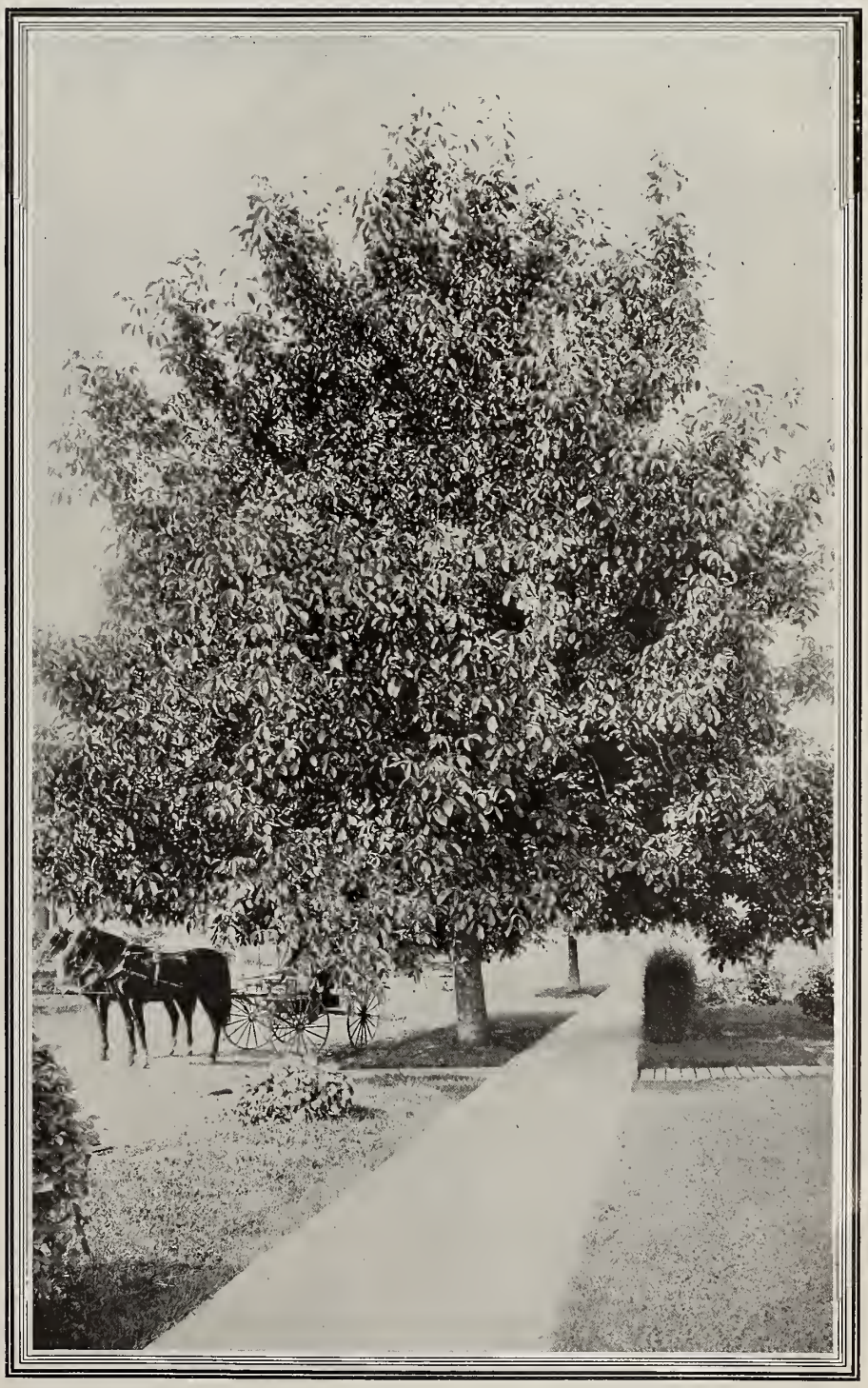
Almonds

"Almonds are now doing best on the higher lands in the Coast valleys, free from fogs and protected from direct winds, but subject to tempered breezes; also at various points in the interior valleys and foothills. The general proposition that lowlands in small valleys should be avoided, and bench or hillside situations preferred, seems to be a safe one. * * * The almond prefers a loose, light, warm soil, and heavy, poorly drained soils should be avoided. * * * The almond is, however, a very deep rooting tree, and may succeed by reaching deeply for moisture rather than by denying itself, as some think."

The above quotation is from E. J. Wickson, dean of the College of Agriculture, University of California, the best authority on almonds in the country.

Varieties—I would specially recommend for planting the Nonpareil and Ne Plus Ultra of the paper shells, and Drake's Seedling and Texas Prolific of the soft shells, as being the surest and largest bearers. The Texas Prolific and Drake's Seedling will produce the most pounds per acre, but do not bring quite as high a price in the market as the paper shells. About three varieties should be planted to insure perfect pollination. The Drake's and Texas Prolific are late bloomers and, as a rule, are good pollinizers, while the paper shells, as a rule, are deficient in pollen, the I X L being specially deficient in self fertilization. Among the paper shells the Nonpareil is the best pollinizer and fruits freely, if planted alongside of Texas Prolific (one of the very best pollinizers, blooming about two weeks later, but in time for the pollen to catch), or alongside of Drake's Seedling, the two surest and heaviest bearers of any varieties.

In planting almonds the following are the best systems: Plant two rows Nonpareil, then one row of Drake's Seedling or Texas Prolific, then two rows Ne Plus Ultra, then one row of Drake's or Texas Prolific. This gives twice as many paper shells as soft shell varieties and insures good cross fertilization. If an equal number of soft and paper shell varieties are wanted, plant two rows Nonpareil,



AN ENGLISH WALNUT TREE AT SALEM, OREGON. TWELVE YEARS OLD AND PRODUCED FOUR BUSHELS OF NUTS THIS SEASON

THE FAMOUS FRANQUETTE WALNUT, AS GROWN NEAR SALEM, OREGON

two rows Drake's, two rows Ne Plus Ultra, and two rows Texas Prolific. We do not recommend planting paper shells without some Drake's Seedling, Texas Prolific or other good pollinizer to insure fertilization, although several varieties of paper shells, planted alternately, often produce the same results.

It has been found by many growers that if Drake's Seedling and Texas Prolific alone are planted larger returns have been secured than by planting paper shells. While the soft shell varieties do not bring as high a price per pound as the paper shells, the difference in amount of yield of the soft shells more than offsets the difference in price, and, being late bloomers, are nearest frost proof. I X L and Ne Plus Ultra blossom first, followed by Nonpareil, Drake's several days later, Texas Prolific being the latest bloomer, about ten days after Drake's.

BRANCH OF ALMONDS
Soft-shell almonds, wherever given a trial in Skamania County, Washington, have done well and bear as early as peach trees

A prominent and successful California grower says: "As to prices, the Nonpareil at 14 cents per pound, Drake's Seedling at 11 cents and Texas Prolific at 10 cents per pound will each bring about $10.50 per standard sack; the I X L at 13 cents per pound, about $9.00 per sack; the Ne Plus Ultra at 12 cents per pound, about $8.50 per sack. From this it will be seen that there is no discounting the Texas Prolific because it is not a paper shell or does not bring so high a price as a paper shell, when we remember that it will, on the average, give twice as many sacks as the paper shells."

The reasons almonds cannot be raised in most sections are that they blossom early and are very easily injured during and immediately after blossoming by frosts; also that rains during the blossoming period prevent pollination, as they should have sunny weather while in bloom. For these reasons late blooming varieties are always best in any place. The Nutland Hills, on the north bank of the Columbia in Washington, being colder in winter than California, holds back the trees, which blossom several weeks later than in the South, and the entire absence of late frosts makes this an ideal almond section.

Propagation—The trees are usually set from twenty to twenty-five feet apart in the rows. We advise twenty-five feet, as it will save taking out part when reaching maturity.

Pruning the almond is simple. Trees should be headed low, and after the third year little pruning is necessary, except to thin out objectionable branches, for the trees should not be allowed to become too dense. They should have about the same cultivation as other fruit trees, but will stand much more abuse in this respect than pulpy, juicy fruits.

Harvesting Almonds—It will be interesting to our readers to learn the method of harvesting the crop, as told by Professor Wickson:

"Almonds are gathered by spreading canvas under the tree and shaking the branches; the few nuts remaining can be removed by striking with a bamboo or other light rod. The gathering should take place after the hulls have burst open, but should not be delayed until the nuts are discolored. Discoloration of nuts depends upon local atmospheric conditions, and is worse in regions subject to moist winds or fogs from the ocean. On dry plateaus perfectly bright nuts are produced naturally.

"Hulling is done by machines devised for the purpose. Usually not over five per cent are 'stick-tights.'

"In California most of the nuts are bleached, and for the greater part of the almond product bleaching is apparently demanded by market requirements. Sulphur should not be applied until the nut is thoroughly dry, or else the fumes will

E. E. MORGAN
President Walnut Grove Company

penetrate it and not only spoil its flavor but destroy its germinating power. The nuts are dried by exposure to the sun on trays, and in dewy places should be covered at night. After being well dried, sprinkle the nuts sufficiently to moisten the surface only and apply the sulphur fumes. The fumes are applied until the nuts are of a light yellow color. The proper shade is to be learned by securing approved samples from a trustworthy dealer."

THIS SMALL BRANCH, CONTAINING THIRTY-TWO WALNUTS, CUT FROM ONE OF THE YOUNG TREES OF E. E. MORGAN, YAMHILL COUNTY, OREGON

Filberts and Chestnuts

Filberts have been grown in a small way at Salem, Vancouver and elsewhere, and appear to be very well adapted to our climate and do especially well on our hill soil. They are quite profitable and in time may become of commercial importance.

Chestnuts have not been grown in sufficient quantities to tell what they would do commercially, but the flavor is good and the quality seems equal to those grown elsewhere.

Importations

Statistics are usually very dry reading, but are important when making an investment. The following were secured at the United States custom house:

ALMONDS

Year	*Pounds imported*	*Valuation*
1904	9,838,852	$1,246,474
1905	11,745,081	1,520,063
1906	15,009,326	1,825,474
1907	14,233,613	2,331,816
1908	17,144,958	2,410,648

WALNUTS

Year	*Pounds imported*	*Valuation*
1904	23,670,761	$1,729,378
1905	21,684,104	1,469,463
1906	24,917,028	2,193,653
1907	32,597,592	2,969,649
1908	28,887,110	2,765,486

And on the above importation a duty of six cents per pound for shelled and four cents per pound for unshelled almonds was paid; and five cents per pound for shelled and three cents per pound for unshelled walnuts, the above figures being for both shelled and unshelled nuts.

This does not look much like overproduction, does it?

Other nuts, such as filberts, chestnuts, etc., were imported in about the same average ratio of increase, the rate of increased nut consumption keeping in advance of increase in production.

In closing I want to repeat just a word of caution. Before planting or buying a nut orchard, be sure that the location and soil are adapted to the nuts planted, and when walnuts or almonds are selected, look carefully into the subject of late spring frosts, which are likely to injure or ruin the crop. Be careful to select only the best commercial varieties and the ones that have been proven the surest bearers. Also keep in mind that the late blooming varieties are safest, on account of frost, provided they are not too late to mature. The future of nut growing in the Northwest is bright and the possibilities great.

ALMOND BRANCH
A foot of almonds from Goodnoe Hills, in the almond section of Klickitat County, Washington, on the north bank of the Columbia River

BRANCH OF FRANQUETTE WALNUTS FROM A TWELVE-YEAR-OLD TREE ON WALNUT GROVE COMPANY'S PROPERTY

HISTORY OF THE WALNUT INDUSTRY IN OREGON

BY H. M. WILLIAMSON, SECRETARY STATE BOARD OF HORTICULTURE OF OREGON

IT is taking time by the forelock to write a history of the walnut industry in Oregon. The industry is only entering upon its career, which promises to be of unlimited duration and to give some future historian a topic worthy of his best efforts. At this time, history, as far as it relates to the walnut in Oregon, is confined to the founding of the industry.

Walnut planting in Oregon began soon after the arrival of the pioneers who came across the plains more than sixty years ago, but the earlier plantings were of the American black walnut. This tree and the California black walnut, as well as the Japanese walnut, are varieties which are, as yet, in the category of the ornamental rather than the useful in Oregon. The walnut industry of Oregon is the growing of nuts of the Royal walnut, or walnut of commerce, commonly called the English walnut and sometimes the Persian walnut. It has been impossible to learn who was the first planter of the Royal walnut in Oregon. Nuts were planted fifty years ago, and perhaps at an earlier date. No one planted many in the early days. Those who did plant were moved to do so by hope rather than by faith. The first planters, as a rule, bought at the general store the nuts they planted. In a few instances, early settlers of German birth sent to the "Fatherland" for nuts for planting. As a large share of the nuts eaten on the Pacific Coast in early times were raised in Chile, the greater part of the older walnut trees are of the Chilean or Santa Barbara type. This type of walnut tree is not only more tender than the type which prevails in Europe, but it starts into growth much earlier in the spring. This latter trait results in the killing of the blossom shoots nearly every spring in Oregon, and consequent failure to bear, except in unusually favorable years. This is a rule, however, to which there are a good many exceptions. Owing to the variation in habits of growth which we might naturally expect in seedling trees, there are a number of fine trees of the Chilean type in this state which bear with commendable regularity good crops of nuts. There are also a number of old trees in bearing which appear to be of the European type. Among the older bearing trees in Oregon which are well known are one in Salem, not far from the capitol; the St. Helens tree, which was planted at the home of the well known Oregon pioneer, Dr. McBride; the two trees on the block once the Dekum homestead, on Morrison Street in Portland; a tree at Brownsville, and several in Yamhill County, as well as one in the foothill country east of Portland, which will be hereafter mentioned. At the Apple and Walnut Show held at McMinnville in 1907, an exhibit was made of walnuts representing trees of four generations in bearing in that county. The ancestral tree was said to be about fifty years old, and the nuts of each generation were quite similar in size and quality.

H. M. WILLIAMSON, SECRETARY OREGON BOARD OF HORTICULTURE, IN HIS OFFICE CHAMBER OF COMMERCE, PORTLAND, OREGON

The real beginning of the development of the walnut industry in Oregon was brought about by the efforts of the late Felix Gillet, of Nevada City, California. Some thirty-five years ago he began the work of convincing the people of Northern California and of the Pacific Northwest, they could make a success of growing walnuts on a commercial scale, if they would but plant the varieties adapted to the climatic conditions of this region. While other nurserymen imported a few trees from France, and a few of them aided Mr. Gillet in interesting the people of California in planting French varieties, Mr. Gillet was the man who persevered in fighting the battle for the introduction and planting of the Franquette, Mayette and many other varieties from France, which, as he predicted, have proved admirably adapted to the climatic conditions of Oregon, and which, by reason of their habit of starting into growth late in the spring, do not suffer from spring frosts. Through his efforts, the planting of Franquette, Mayette and other varieties of trees in a small way, was commenced in Oregon about twenty years ago. One of his earliest converts, and one who has never fallen from grace, was Colonel Henry E. Dosch, who, by letters to the press and addresses at fruit growers' meetings, became the leading factor in creating interest in walnut culture in Oregon. The address by him which was most notable in its effect, was delivered before the Oregon State Horticultural Society, in 1892. In the same year the late Mr. W. S. Failing, then one of the most prominent nurserymen of Oregon, informed the Rural Northwest that the walnut was a success in Oregon. He called particular attention to a thrifty walnut tree then in bearing in the foothill country, twenty miles east of Portland. There are now a goodly number of bearing walnut trees in the section about that tree, which have grown from the nuts it bore.

EXHIBIT OF APPLES BY D. C. VAN DORN, DAYTON, YAMHILL COUNTY, OREGON

By 1897 so much had been published in the Rural Northwest of Portland in encouragement of the planting of walnut trees in Oregon and Washington, that a leading horticultural paper of California kindly warned the Northwest not to engage in walnut culture with a view to profit.

In 1896, Mr. Thomas Prince, a manufacturer of Massachusetts, who has a large prune orchard at Dundee in Oregon, became interested in the possibility of making walnut growing profitable in Oregon, and determined to give the matter a test on a large scale. He planted at Dundee three hundred and fifty trees in 1897, and fourteen hundred in 1898. These were obtained from Mr. Felix Gillet, and were, with a few exceptions, what are termed second generation trees—that is, trees grown from nuts raised on grafted trees. The greater part of the trees were seedlings of the Mayette and Franquette. Since that time, and especially since the first planted trees began to bear, Mr. Prince has planted more trees, until his walnut grove now exceeds one hundred acres in area. A fine display of nuts grown on his trees was made at the Lewis and Clark Fair in 1905, and these nuts attracted the attention of an Eastern wholesale grocer who makes a specialty of supplying the highest grade of goods demanded by fancy grocers. He was greatly impressed with the quality of the nuts, which he found equal to the best brand of imported nuts. The high quality of the nuts has, in fact, enabled Mr. Prince to sell at a premium of from three to five cents per pound above the highest quotations every year.

The coming into bearing of the trees of Mr. Prince's grove and those in other groves in the same vicinity, and the attractive appearance and high quality of the nuts greatly stimulated the growing interest in walnut culture, and especially in Yamhill County. A walnut club was organized at McMinnville, which has done excellent work in obtaining and disseminating information about walnut culture and in developing a healthy and legitimate interest in the industry. The second large grove planted in Oregon is that of Mr. J. B. Stump, of Monmouth, Oregon. His trees are now beginnning to bear freely. A smaller grove planted by Mr. C. E. Ladd on the Oak Hill Stock Farm, about the same time that Mr. Prince inaugurated the planting of the walnut, has also helped to develop faith in the industry.

TWELVE-YEAR-OLD PROEPARTURIEN WALNUT AT McMINNVILLE, OREGON

There are no statistics available to enable an estimate to be made at the present time of the acreage now in walnuts in Oregon. Planting had only fairly commenced when the United States census of 1900 was taken. There were at that time 7,201 "English" walnut trees in Oregon, and the crop of nuts for the previous year amounted to 6,110 pounds. During the past two years planting has been done on a large scale and it is certain that there will continue to be a rapid increase in the acreage devoted to walnuts in Oregon for many years to come.

The extremely unfavorable weather of the past winter has been one of the best things which could have happened to many heedless persons who planted walnut trees without first taking pains to learn anything about the business. The destruction of thousands of young trees of the Santa Barbara type was a blessing to those who planted them, and the planters deserve no sympathy, for the warnings not to plant trees of that type have been ample for many years past. Other planters who set trees of the right varieties have, by the severe weather of the past winter, been enabled to discover at the outset that the locations selected for their groves were unfavorable.

The fine condition of suitably located groves of walnut trees of Franquette, Mayette and other French varieties, after a winter which proved the most trying one to fruit trees of all kinds which we have known during a long period of years, has given firm confidence to those who are leading in the development of the walnut industry in Oregon.

The history of the development of the walnut industry to its present condition justifies the belief that it is to become one of the important branches of horticulture in Oregon. There is an ample supply of land which in site and soil is adapted to the walnut; the climatic conditions are favorable, especially in the Willamette and Umpqua valleys; the health and vigor of trees forty years old and older, indicate that in Oregon the walnut tree will enjoy the long life which is common in Europe; the varieties which are best adapted to culture in this state are those which produce the finest nuts known to the world.

VIEW OF YOUNG WALNUT ORCHARD PURCHASED OF E. E. MORGAN BY THE SCHOOL TRUSTEES OF THE EPISCOPAL CHURCH, TO PROVIDE AN ENDOWMENT FUND FOR A BOARDING SCHOOL FOR BOYS

WALNUT CULTURE IN THE PACIFIC NORTHWEST

BY HENRY E. DOSCH

AGREEABLE with your kind invitation and my promise to you, I beg to give you my experience with nut culture, and more especially the French walnut. I have spoken so many times on this, to us, most important subject that I had hoped the question

HENRY E. DOSCH OF HILLSDALE, OREGON
Director of exhibits, Alaska-Yukon-Pacific Exposition, Seattle, Washington. Mr. Dosch has been prominently connected with every exposition for the last twenty years and has always taken a prominent and active part in growing fruit in Oregon, in addition to his public work.

was thoroughly understood, but from the many letters I continue to receive, not only from Oregon and its neighboring states, but from practically every state in the Union, and latterly from the pecan-growing states of our Southland, it seems necessary to go over the whole field again, even at the risk of repeating myself, but as one of my old schoolmasters said nearly fifty years ago, "A subject is always new, no matter how often repeated, until it is thoroughly understood by every scholar"; and again, are we not all scholars; some freshmen, some sophomores, some even juniors, and very few seniors, but all scholars just the same, and the deeper we go into any subject, the older we grow in the study of nature and her wonderful ways, we find that most of us never get beyond the freshman class, hence I approach this subject again with a good deal of timidity, but I see before my mind's vision the words of Carlyle when he said, "You can help your fellow man; you must help your fellow man. It is a duty, nay, even a divine privilege to lighten the burden of our fellow laborers by giving them the results of our best thought and experiences."

It is over twenty years since I first experimented with nut culture, more especially English, or, more properly speaking, French walnut culture, and by persistent effort in keeping this matter before the horticulturists am more than gratified to know that this important industry is at last receiving the attention it deserves, and a few who took my advice in the beginning and planted on a commercial basis are now reaping the benefit, as their products command the highest price in the market, which I will explain later.

True, we have as yet but one grove in full bearing which has attained to one hundred acres, but there are many smaller groves of from five to twenty acres. All of those which were planted in proper soils and of varieties adapted to our climate have proven revenue producers; even the trees on my own soil, which is absolutely unfitted for walnut culture, being a heavy clay soil underlaid with six feet of hardpan, have produced some very fine nuts. As I stated in the beginning, it is now over twenty years since I first experimented in nut culture, and it is not necessary to state here the many obstacles that had to be overcome and the many disappointments I met with, though practically all the walnut trees planted since in Oregon, Washington, British Columbia and even Montana, Wyoming, Idaho and Utah, many of which are now in full bearing, were planted at my earnest solicitation; my advice has proven so satisfactory to the planters and that walnut culture has attained the dignity of a horticultural pursuit, alongside of the apple, pear, cherry and prune.

It is not pleasant to repeat oneself, but in a paper like this, which in a measure at least is to be a guide to many persons

THIS TWELVE-YEAR-OLD TREE GROWING IN THE ORCHARD OF E. E. MORGAN, NEAR McMINNVILLE, OREGON, PRODUCED THIS YEAR OVER ONE HUNDRED POUNDS OF WALNUTS, WHICH BROUGHT TWENTY CENTS PER POUND

who desire to plant nut trees and have had no experience, it is absolutely necessary to repeat the fundamental principles and "modus operandi" in nut culture, so they can start right, and if the instructions herein given are intelligently and earnestly observed they will be sure to reap a good harvest.

In nut culture of all kinds, but more especially with walnuts, three things are most essential, and it is difficult to say which is most important, but they are soil, generation and variety. Nut trees of all kinds do well on most soils, even rocky ground, except heavy, stiff, clay soils, but do best in fairly rich soil, as they are gross feeders, but there must be no "hardpan." The subsoil must be loose, and open, so the tap root can grow down as far as it desires, for so soon as it strikes the hardpan the tree stops growing and of course lessens the nut crop, as nut trees make few lateral roots. In fact, it is suicidal to plant nut trees on very heavy, stiff clay soils or on soil underlaid with hardpan. This applies particularly to walnuts.

When I first began experimenting I grew a good many trees of various varieties, and gave away hundreds of yearlings, even paying express charges and postage on them to all parts of the Pacific Northwest to make sure and

YOUNG WALNUT GROVE AT VILLA EICHENHOF, COUNTRY RESIDENCE OF HENRY E. DOSCH

ascertain first if the walnut would do as well here as in Europe, and also which varieties were best adapted to our climatic conditions. Wherever planted on proper soils the trees have reached a height in twenty years of forty feet, while those planted on heavy clay soils or land underlaid with hardpan are, like my own, only ten to twelve feet high, and for ten years past have never made more than one inch of growth in a year, where on good soil they would have grown from three to four feet each year.

Walnut trees should be "second generation," either grafted or grown from first generation nuts, but as generation is not generally understood, and the reason I emphasize the necessity for securing nuts of first generation, I will now explain, so that no possible mistake can be made.

First generation nuts are produced on original trees, or on trees grafted from the original trees. These nuts when planted produce "second generation" trees, and the nuts from these second generation trees are a little larger than the original or first generation, which is due to the peculiar soil and climatic conditions of the Pacific Northwest, so well adapted to nut culture. Trees grown from second generation nuts retrograde very rapidly, producing nuts not half so large as even the first generation trees, and finally run out altogether. Hence it is very essential that we plant nuts from the original trees, or trees grown from the original nuts or grafted from the original trees.

After giving a thorough test to all known European varieties, as well as the soft and paper shell varieties of California, I have reached the conclusion that for the Pacific Northwest the Franquette and Mayette are best adapted to our soils, climate and market, with a few Chabertes for confectioners' use, giving preference in the order named. I consider the Franquette somewhat hardier, a regular bloomer and a little more prolific, while the Mayette or Grenoble, under which name this nut is known to the trade, is finer, though not quite so hardy nor so prolific, but the nuts generally bring a little higher price in the market.

The Franquette walnut was originated about the same time as the Mayette in the southeast of France by a man named Franquet. It is quite large, of an elongated oval shape, and very attractive; the kernel is full fleshed and sweet. It buds out late in the spring and has never been injured by frost on our place, though the altitude of this locality is quite high.

Courtesy Churchill-Matthews Company

ONE OF YAMHILL COUNTY'S YOUNG GROVES

The Mayette walnut is one of the finest dessert nuts grown. It is quite large and uniformly so, well shaped, with light colored shell. The kernel is full fleshed, sweet and nutty. But the characteristic which renders this remarkable kind so much more value is its very late budding out, which enables it to avoid the disastrous effects of late frosts in the spring. It is an abundant bearer. This is the walnut imported into the United States under the name of "Grenoble," but on account of the duty, as in France the nut is a high priced one, a common, cheaper grade is mixed with it, to the disgust of nut importers and dealers in Chicago and New York. The Mayette was originated by a grower named Mayet, about one hundred and forty years ago, the nut having been a great favorite ever since.

The Chaberte walnut is an old and most valuable variety, late in budding out. The nut is well shaped, a roundish oval, and of fair size, although not what would be considered a large nut. The kernel is extra fine quality, the tree

PLATE XII.—FIGURE 1. KESWICK CODLIN CROSS-POLLINATED. FIGURES 2 AND 3. SELF-POLLINATED. NOTE THE ABSENCE OF SEEDS IN SELF-POLLINATED APPLES (SEE ARTICLE PAGE 40)

a good bearer. The Chaberte was originated over a century ago by a man named Chaberte, hence its name.

The foregoing descriptions are taken from the catalogue of Mr. Felix Gillette, the former veteran walnut grower of Nevada City, California.

For a number of years past there has been considerable controversy about trees grown from seed of first generation bearing smaller nuts than grafted trees. I have not found it so, for I have just as large and fine nuts on my trees grown from first generation nuts as those from grafted trees, but have also found that both kinds have some extra large nuts and some smaller, which led me again to study that point, and I have reached the conclusion that the difference in size is due to perfect pollination of the larger nuts and imperfect pollination of the smaller ones. I fear that this controversy was started by interested parties to discourage the planting of nuts and encourage the planting of grafted trees, which generally sell at high figures. Of course, one must be careful to secure the proper variety and generation of nuts, which heretofore have been very difficult to obtain. Even the nuts I imported from France proved very unsatisfactory as to size and quality. However, there are many honorable dealers from whom first generation nuts, as well as trees grown from first generation nuts, can be procured.

MEN LINED UP IN THE FIELD OF OREGON NURSERY, SALEM, READY FOR PLANTING SPECIAL FRANQUETTE STRAIN IN THE GROUND

There are, no doubt, many planters who prefer to plant the nuts where the tree is to grow rather than the expensive grafted trees, and for their especial information I will repeat the modus operandi: The nuts for this purpose must be secured in the fall, and must be of first generation, either from the original trees or grafted trees, and known to be true as to that point, else you will be disappointed when the trees come into bearing. Fill a box six inches with light soil and sand mixed, then put in the nuts, pointed end up, setting them about one inch apart; cover three or four inches deep and place box out of reach of rats, gophers or squirrels, keeping the soil moist. Upon examination in the early part of April you will find all sound nuts have sprouted or are ready to sprout; that is, they send out two sprouts from the pointed end of the nut. One of these sprouts turns down over the nut and forms the tap root and the other continues upward and forms the tree. Now remove them very carefully, as these sprouts are very brittle and easily broken, which would make the plant worthless. Plant them either where you wish the trees to grow, fifty feet apart (by far the best way), or in nursery rows about five inches deep, and transplant the following spring. The young trees should be allowed to grow straight up, cutting away all side branches, till the tree has reached a height of six feet, when it should be allowed to branch out, but under no circumstances should the main stem be cut off.

WAGONLOADS OF WALNUTS PURCHASED FROM THE VROOMAN ORCHARD BY THE OREGON NURSERY COMPANY, SALEM. THESE NUTS WERE PLANTED TO GROW NURSERY STOCK TO MEET THE RAPIDLY GROWING DEMAND FOR WALNUT TREES

Walnut trees usually go into bearing in five or six years; at twelve years are in full bearing. It is not a slow grower, as is commonly supposed, as from three to four feet is not an unusual growth in a season, on good soils; besides, it is a healthy tree, having, comparatively speaking, very few pests to molest it, and once established lives to a good old age and proves profitable to generation after generation with ordinary good care.

The ground between the trees, until they come into full bearing, can be utilized for berries and vegetables, but no grain or grass should be permitted.

At harvest time the nuts fall to the ground as soon as the hull bursts, which it does when the nuts are ripe, and can be picked up easily, and must be promptly, as the squirrels are very fond of them. They should then be cured, either in the sun or by subjecting them to a gentle heat in an evaporator, to prevent the nuts becoming mildewed or rancid. Sulphuring is practiced to some extent to supply the demand for bleached nuts, a most pernicious method. This treatment, while improving the color, proved decidedly injurious to the flavor of the nuts and lessened their keeping qualities. At the California Experiment Station experiments with bleaching solutions have been carried on and it is reported very satisfactory results have been had with a mixture of sal soda, chloride of lime and water. However, it must be borne in mind that the bleaching of nuts is entirely unnecessary and adds nothing whatever to their food value; this process is carried on simply to improve the appearance of the nut, and will probably continue to be carried on so long as people buy by the eye; but I say to you, "Don't do it, unless the customer to whom you sell the nuts demands it and prefers spoiled to clean, healthy, wholesome and toothsome nuts."

"WALNUTMERE"

This picture represents the residence, walnut drier and all outbuildings. A flavor of romance attaches to Walnutmere in the possession of its historic treasure, an old adobe building (notice the same indicated by the white cross). This and its neighbor just across the line are the only adobe relics of the old Spanish regime, of which the Rancho de Cabeza was a factor. Madame Carillo, its builder, was the sister of Madame Vallejo. General Vallejo obtained from the Spanish government two extensive grants, one for his wife and one for her sister. Madame Carillo was the grandmother of Romoldo Pochico, one of California's honored governors and congressmen. In his young boyhood he played about the little adobe while it was being built for his aunt. This history makes the adobe greatly appreciated by the present owner of Walnutmere.

A GROUP OF PROMINENT CITIZENS INSPECTING AND SAMPLING THE FRANQUETTE NUTS BEFORE THEY WERE PLACED IN THE GROUND AT THE OREGON NURSERY, SALEM, APRIL 14, 1906

In the beginning of this paper I promised to explain why Northern grown walnuts commanded a higher figure in the Eastern markets than the California product, and will in a way allay the apprehension voiced in some quarters that we cannot compete with California in this particular industry, and prove that we are not even in the same class. The output of Thomas Prince's walnut grove of one hundred acres was sold to a grocer in New York who makes a specialty of supplying those retail grocers of the country who handle only the finest and costliest brands. This merchant states that the walnuts from Southern California do not come up to the requirements of his trade, but that he thinks the Oregon nuts will, as they are of the same varieties and similar in quality to the

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AN ATTRACTIVE VIEW OF THE WALNUT GROVE COMPANY'S PLANTATION. ALL LAND SHOWN IN THIS PICTURE IS NOW BEING PLANTED TO WALNUTS

nuts he imports from Europe for his trade (Franquette, Mayette, Parisienne and Chaberte); in fact, they are better flavored and more nutty than the Southern California product, hence, as said before, not in the same class. What is said here of the Oregon walnuts is equally true of all French walnuts grown in the Pacific Northwest.

The importations of nuts into the United States have steadily increased in the last few years. The Government Year Book for 1907, just received, gives the following table showing the importations for the last five years:

ALMONDS

Year	Quantity	Value
1903	8,142,164	$1,337,717
1904	9,838,852	1,246,474
1905	11,745,081	1,520,063
1906	15,009,326	1,825,475
1907	14,233,613	2,331,816

WALNUTS

Year	Quantity	Value
1903	12,362,567	$1,106,033
1904	23,670,761	1,729,378
1905	21,864,104	1,469,463
1906	21,917,028	2,193,653
1907	32,597,592	2,969,649

OTHER NUTS, CHIEFLY CHESTNUTS

Year	Value
1903	$1,514,406
1904	1,523,462
1905	2,082,344
1906	2,055,557
1907	2,100,274

This tells a story to be studied carefully, as a good share of them comes to Oregon, Washington, Idaho and British Columbia. We of the Pacific Northwest should be exporters instead of importers. We have the soil and the climate, hence my earnest advice is, plant a few walnut trees, if you do not wish to plant a grove, and your children's children will bless you and thank you for your forethought. As a business proposition I know of no better in agricultural or horticultural pursuits, and once established, a well cared for grove is the best heritage a parent can leave to his family, as they become more valuable and more productive with age, always bearing in mind, soil, generation and variety. To illustrate: A friend called upon me some ten years ago and said he had two acres he wanted to plant to fruit trees, and I advised him to plant Franquette and Mayette walnuts, which he did, as his soil was well adapted to nut culture. These trees are now ten years old from the nut and yielded last fall two tons of very fine nuts, which he sold at eighteen cents per pound, or $360 per acre. These trees will increase, of course, in productiveness from year to year and eventually make their owner independent. To further illustrate: One tree near Albany, Oregon, sixteen years old, produced nuts which sold for $30. Another Franquette tree now twenty years old near Brownsville, Oregon, produced nearly eight bushels of fine nuts, which were sold for $40, and many others just as productive. These are samples of what walnut trees will do on good and proper soil.

Although this paper was to be on nut culture in general, I have devoted most of the space to the French walnut, for the reason that it is a larger business proposition for the Pacific Northwest than all others combined; but for the benefit of those who desire to branch out I will give varieties and my experience with them.

My experiments in chestnuts have not proven so satisfactory as hoped for, as most varieties are too tender, do not bloom uniformly, or, in other words, the staminate or male blossoms come from two to four weeks before the pistillate or female blossoms appear; hence no, or at best imperfect, pollination. This is particularly true of the finer French varieties, as the Lyon, Merle and Nonzillard; while the Grosse, Precose and Combale produce some very fine nuts for home use, though not of sufficient quantity for commercial purposes. Those best adapted for the Pacific Northwest are Numbo, Paragon, Italian and Spanish. The trees require the same soil and treatment as walnuts; are healthy and rapid growers, and from an esthetic standpoint a most handsome ornamental tree. All chestnuts must be grafted from grafted trees, as seedlings are very indifferent as to quality of nuts, and most of them are barren.

You will have noted that large quantities of almonds are brought into the United States from foreign countries, notwithstanding that California alone produced in 1907 5,200,000 pounds. Southern Oregon also produces a large crop, but I have been unable to secure correct figures. I have experimented with the soft-shell varieties such as Princess, Nonpareil, I X L and others, but find the same trouble as with the finer French varieties of chestnuts—while they bloom profusely there is no pollination. However, there is one variety perfectly adapted to our climate, the Grosse Tendre or improved Languedoc, a strong, hardy tree, profuse bloomer and abundant bearer every year. The nuts are extremely large, the shell soft enough to be readily crushed in the hand, and of excellent flavor. I have two very choice trees, and like the chestnuts, they are propagated by grafting only, as seedlings are very indifferent as to the fruit.

The filbert is a variety of nut which is especially adapted to our soil and climatic conditions, as it is first cousin to the hazelnut, which grows wild and in such abundance all over the Northwest. The best varieties are the Barcelon, similar to the old English cobnut, only larger and finer flavored, and the red and white Aveline and Du Challu, rapid growers and prolific bearers. Filberts are propagated by layering, that is, branches are bent down and pinned to the ground at intervals, and covered with dirt, where they root, after which they are cut and planted.

Pecans have not received the attention they deserve. With me the trees have grown nicely, but have not yet fruited, which I attribute to the inadaptability of my soil and location. Pecans delight in moist soils, preferably bottom lands which are subject to overflows, but I question whether the large, fine varieties of the South will fruit with us; though I have no doubt that the ordinary pecan as raised in Illinois and Missouri will do well in the Northwest, for which purpose any good sized pecan purchased at stores can be used. They are certainly worthy of a trial.

Butternuts, black walnuts and hickory nuts grow nicely and bear some fruit, but have not much commercial value.

I do not know of anything in horticulture in which more experiments have been made and with less success than grafting the walnut, and I know of very few instances where over ten per cent of the scions united with the parent tree. Professor Leckenby, the noted agrostologist, who resigned a high position with our government to go to the Philippines to study plant nature, as he is a most ardent student, gave me the following formulae with the privilege of making it public in my next paper—and it is here given for the first time—stating that if the directions were followed religiously, ninety per cent of the scions would grow.

For walnut grafts on scions: Use one gallon of water with four teaspoonfuls of sulphate of quinine.

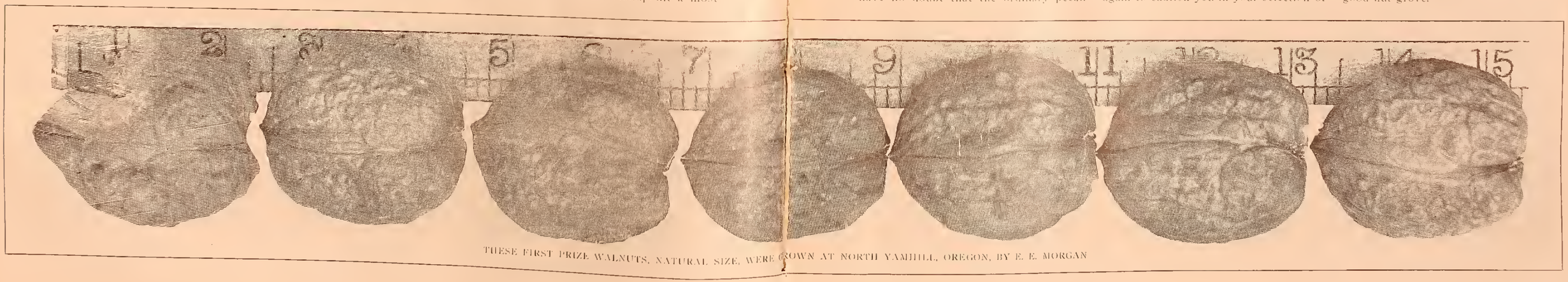
Cut scions submerged in the solution, and wash cut on the tree at once, to prevent it from turning black, acting as an antiseptic; then insert scion, as on other fruit trees.

For a year or more past I have been in receipt of many letters, notably from the East, asking me about certain tracts having been planted to walnuts, and the agents proposed to care for them for a number of years at a big figure, and in some instances at least have referred to me. Now these gentlemen may be perfectly honest, but the question arises, do they know walnut land, and have they studied soils and varieties? Remember, the loss of money is a small matter in comparison with the loss of years, when you find out that either the land or the varieties, or both, are not as represented, or as they should be; hence allow me again to caution you in your selection of either land, trees or nuts. Do not take a dealer's assertions for granted, unless you know him to be perfectly honest and reliable.

In selecting land, dig down at least ten feet in depth in summertime, and any land that cannot be spaded to that depth easily is unfit for nut culture. Be sure you are right in your selection of soil, trees and nuts, then go ahead, and if you have secured the correct variety and generation, and selected the proper soil for planting, you will never regret it.

In conclusion, permit me to say, though repeatedly stated and published, that I have neither trees, nuts or land for sale, as I continue to receive many letters asking me to quote prices. My experiments in nut culture are and have been partly for my own pleasure and partly for the benefit of those who are interested and desire to plant and own a good nut grove.

THIS EIGHT-YEAR-OLD MAYETTE WALNUT TREE IN YAMHILL COUNTY, OREGON, PRODUCED THIS YEAR FIFTEEN DOLLARS



THESE FIRST PRIZE WALNUTS, NATURAL SIZE, WERE GROWN AT NORTH YAMHILL, OREGON, BY E. E. MORGAN

THE WALNUT GROWING INDUSTRY IN FRANCE

BY J. B. PILKINGTON, PORTLAND, OREGON

SEVERAL years ago, when walnut planting on an extensive scale was commenced in the Pacific Northwest, the writer went to Europe to investigate this industry, hoping to learn many things which would be of importance to Western growers. That the trip was a disappointment in many ways is candidly admitted, for I expected to find large commercial orchards with up-to-date methods of growing and handling walnuts. Although France has been a great walnut producing country for several centuries, there have been few or no changes, and today their methods are still primitive and but little change has been made in many years.

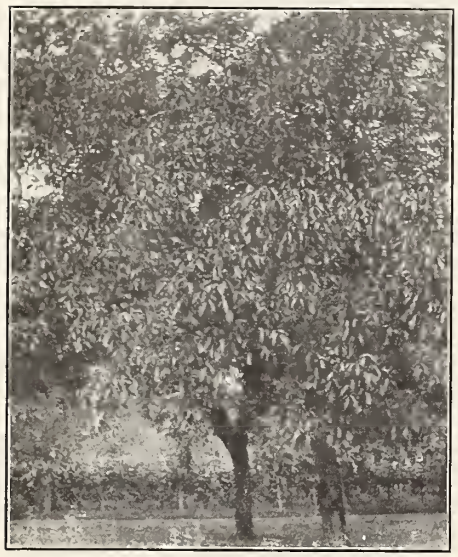


Photo by J. B. Pilkington

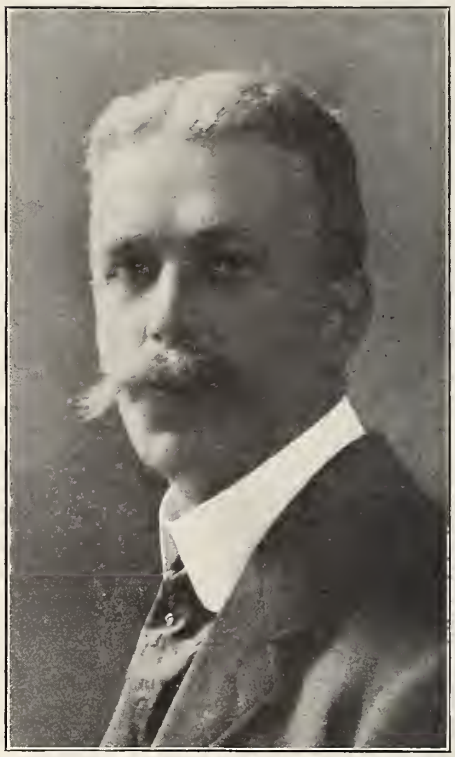
AN OLD WALNUT TREE NEAR GRENOBLE FRANCE

In the New York market the highest grade of imported French walnuts are the Grenoble nuts, and Grenoble being the capital of the Isere district, which is the largest and best known walnut section in France, it was Grenoble I first visited. Here I found difficulty in making known my wants, for there are few English speaking people, particularly in the rural districts, and these good, thrifty people are disinclined to tell what they know. I traveled over considerable of this district and with the aid of an interpreter was able to get some information as to temperature, rainfall, elevation, etc., that is valuable for comparison with our home conditions, and likewise from observation I fully satisfied myself that our Oregon country is vastly superior to this old established walnut section.

The Isere River, rising in the French Alps, flows through the district. The mountains which inclose the valley range from 6,000 to 12,000 feet in height, and in July many of them are still covered with snow. The proximity of the snow mountains causes sudden changes in the atmosphere, so that heavy hail storms are frequent, and this is the greatest danger the walnut growers have to contend with.

In the foothills of the Isere Valley are growing thousands of walnut trees, but only a small proportion of them are planted in orchard form, most of them growing singly or in small groups, for the land is valuable and the fertile spots must be used for other purposes; consequently the poorest land, irregular spots and borders of fields and roadways are given over to walnuts, and yet, grown under these adverse conditions, the trees thrive and yield splendid returns.

In France it is admitted that twenty years is required for a walnut tree to come into good bearing, whereas equal results are obtained here in half the time. The reason is obvious: When trees are planted in such barren, rocky places as they frequently are in France, the wonder is that they grow at all. There are thousands of acres of land in the Pacific Coast, now considered worthless, that is vastly superior to the glacial deposits in the Isere Valley, where the foothill soil is practically fine shale rock; but nevertheless I found trees over one hundred years old, seventy feet high, with bright and healthy foliage, well loaded with nuts, growing in such soil. It is probable that the scattered manner of their growing contributes largely to the thrift of the tree, for the walnut is a strong grower, its roots penetrating to great depths, so even poor soil gives results when the soil has depth and the tops have room for expansion.



J. B. PILKINGTON, PORTLAND, OREGON

As to varieties, the Mayette or Grenoble walnut predominates, while the Franquette, Parisienne and Chaberte are extensively grown, the Franquette ranking with the Mayette except in quantity of production. The Parisienne ranks very high in quality, but is very late in ripening. The Chaberte is smaller than the other varieties, but is of fine quality, and its extreme hardiness adds to its value. It is frequently used as a stock on which to graft other varieties, and as I found it growing and bearing at an altitude of 2,000 feet, it is desirable for planting in elevated situations. Many other varieties are known, but are not extensively cultivated, and the four mentioned are representative.

The crop of the Isere Valley amounts to several thousand tons, and as the immense product is the aggregate of the holdings of hundreds of small growers, the work of harvesting and curing is not done on an extensive scale, but individual growers are always able to care for their small gatherings, labor being plentiful and competent. Buyers are on hand as soon as the crop shapes itself and the first grade nuts are always at a premium. Seconds are in demand at an inferior

GRENOBLE ET LA CHAINE DES ALPES, LA NUIT. A GREAT WALNUT DISTRICT IN FRANCE

price, and small and defective nuts are used for making oil. Nothing is wasted.

Climatic conditions at Grenoble are nearly identical with Oregon conditions.

It is now over thirty years since the French varieties of walnuts were introduced on the Pacific Coast, and I believe the late Felix Gillett was the pioneer in this line, and for the last twenty-five years of his life he advocated the planting of these hardy varieties—Franquette, Mayette, Parisienne and Chaberte—for the territory to the north of the Santa Barbara walnut district. The soundness of his judgment voices itself today in the fact that this quartet are the leading and recognized varieties; and although there are many other varieties, some of them of Mr. Gillett's own origin, the quartet mentioned have not been overrated; in fact, they are replacing the old established Santa Barbara varieties in California, their superiority justifying the change even when hardiness is not a requisite.

In Oregon the past year has been severe on many newly planted walnut orchards. The unprecedented frost in September, 1908, played havoc with hundreds of young trees, principally among those growing in the lowlands. Trees on higher ground suffered less, some not at all. The result will tend to check planting in exposed situations, so the lesson, while an expensive one to many beginners, is not an entire loss. It will tend to move the plantings to higher ground, where there is less danger.

Care in the selection of trees should again be impressed on intending planters. Many tender varieties are still being planted, and if such trees withstand the weather it is doubtful if their crops will. Grafted trees are becoming more plentiful, but the cost of them will deter many from planting. One should secure either grafted trees or pedigreed second generation seedlings, however, avoiding any and all tender varieties.

Photo by E. Ledgerwood

OLD WALNUT TREE PLANTED IN EARLY DAYS ON DR. SANDERS' PLACE THE DALLES, OREGON

Comparing Oregon with France as to the adaptability of this state to walnut growing, France has several hundred years the start, but Oregon excels the French product in the quality of these very same French varieties. This is not unreasonable. Oregon is favored bountifully with nature's endowments. The same soils, climate and moisture that produce superior grades of apples, cherries, small fruits, which gives the tone and color to our Oregon roses, is also generous with the walnuts. Some day we may have an "Oregon" walnut; but in the meantime we can find all the most desirable elements in our Mayettes and Franquettes.

FORCE OF MEN PLANTING TREES ON PROPERTIES OF CHURCHILL-MATTHEWS COMPANY AT AMITY, OREGON

WALNUT CULTURE—PLANTING, CULTIVATING, ETC.

WRITTEN BY ONE OF THE OREGON NURSERY COMPANY'S STAFF

IN VIEW of the great interest now being taken in walnut culture in the Willamette Valley and the Northwest and the desire for reliable, helpful information, we here present a special pamphlet descriptive of the Franquette walnut. In preparing this work we have kept in mind the fact that walnut culture is still in its infancy and general knowledge along this line limited.

We have personally visited the walnut growing districts of the Pacific Coast, weighing the merits and demerits of the different varieties produced, and to our own experience we here add articles published by reliable and successful growers.

That the Franquette walnut is destined to become a leader in horticulture and a great source of income to the Pacific Coast states we have no doubt. It is the variety possessing all the essential qualities needed to place walnut culture on a paying basis; the nut for the North as well as the South.

For several years we have been carefully searching for grafted trees of distinct strains of the best types of the French walnuts, as our importations from France had been very unsatisfactory, inasmuch as we were unable to get a guarantee from French dealers or nurserymen that the nuts sold by them were grown on grafted trees, propagated in a direct line from the original tree of the variety sold. Although constantly in search of grafted groves of the French varieties, none could be located on the Pacific Coast until our Mr. L. Girod in the fall of 1905 learned that Mrs. E. M. Vrooman of Santa Rosa, California, was the possessor of a very fine grove of Franquettes, all of which were grafted trees, and upon a visit to the ranch he was surprised to discover the finest strain of walnuts he had ever seen. This visit of Mr. Girod resulted in the purchase of all the nuts and scions that could be secured at that date of the 1905 crop, and in addition he made a contract for the entire product of the nuts grown in this orchard for three years, together with all scions to be cut for grafting purposes. It may be of interest to the reader and prospective planter to know something of the history of this celebrated Franquette walnut orchard.

Some time after the death of her husband, the late Senator Vrooman of California, Mrs. Vrooman, in looking over her farm near Santa Rosa, decided that the land was too valuable as real estate to be used for ordinary crops. Being naturally observant, her attention was drawn to the few thriving walnut orchards of the neighborhood. These, however, were planted in mixed varieties, uncertain of bearing on account of non-resistance to late frosts, and when bearing producing a nut of inferior quality. She therefore determined, if possible, to find out for herself the tree which would be hardy, thrifty, a heavy bearer, and especially one that would remain dormant until late in the spring, thereby escaping all dangers of frost. That she has been fortunate in her research the reader can judge. She set out to visit the many renowned walnut orchards of the Los Angeles country, but was not satisfied with the general outlook of things there any more than in Central California, until one day while visiting a certain ranch she discovered there a number of walnut trees that looked unusually healthy and thrifty, and was assured that although the blight prevailed in that section these trees were entirely free from it, and were not only good growers, but heavy bearers of the most excellent nuts. She returned to Central California, where then lived a horticulturist who was experimenting in the culture of walnuts, of

VIEW FROM DWELLING ON WALNUT GROVE COMPANY'S PROPERTY, SHOWING YOUNG WALNUT ORCHARD IN THE DISTANCE. ALL ROLLING LAND SHOWN IN ABOVE VIEW IS NOW BEING PLANTED TO WALNUTS BY THE WALNUT GROVE COMPANY

Courtesy Oregon Agricultural College

NUTS CURING IN THE SUN

which he possessed all the leading market varieties. These different varieties of nuts were kept strictly separate in bins, and Mrs. Vrooman was cheerfully given the privilege of studying at leisure the characteristics of each. Her decision of selection was given in favor of the Franquette, the tree of the same variety she had already chosen as the best grower while visiting the South. She at once purchased all there was to spare of the grafted Franquette walnut trees and turned these over to her manager, Mr. J. F. Burgess, to plant out on the ranch. The second year after planting, the thousand young trees produced, besides what were used at home, ninety pounds for the market. The crop increased rapidly with the size and age of the trees until during the season of 1905 one tree alone, an especially good specimen, bore one hundred pounds of choice, marketable nuts.

In a recent article on walnut culture, published in the Sacramento Bee, Mrs. Vrooman, the owner of Walnutmere farm, says: "If there are no late spring frosts to be encountered, the choice of variety takes a wide range, included the beautiful Santa Rosa soft shell, the Santa Barbara (improved), and the Southern California soft shells, besides all of the French varieties, chief of which may be mentioned the Franquette; also the Mayette, a shy bearer, and the Proeparturien, too small for commerce.

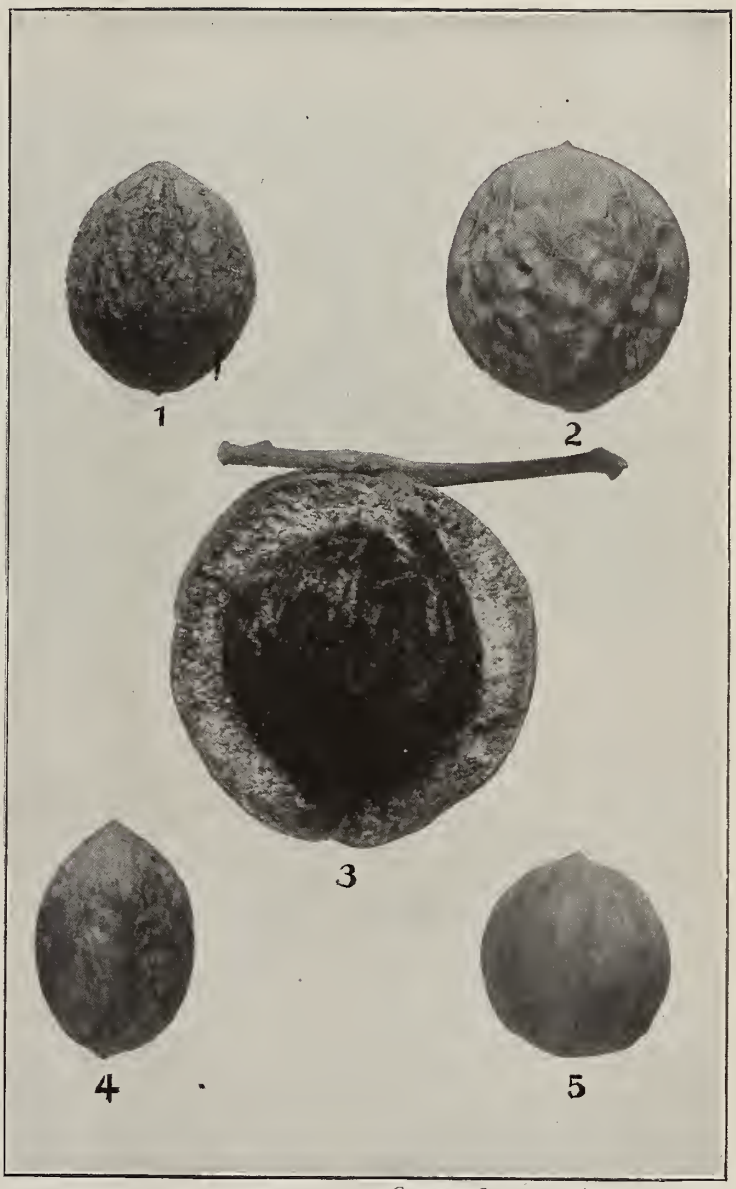
"If late spring frosts are to be reckoned with, a French variety must be chosen, because these bloom from two to three weeks later in the spring than any of the English (soft shell) varieties, and so escape frosts and insure a reliable annual crop. Of the French varieties, Walnutmere happily has only the Franquette, a large, full, white meated and fine flavored nut. For a commercial orchard the variety chosen must bear freely and be large enough to commend itself among its walnut competitors. The Franquette, with me, has fulfilled all these requirements.

"Those intending to plant walnuts need take no alarm from the theory advanced by many that by removing your young trees you endanger their future by cutting off the tap root. In every forest some trees have been torn out by their roots at the mandate of age, wind, lightning or some other cause, and the center of such tree trunks is decayed and hollow. Its tap root long since finished its mission to hold the tree in place and provide nourishment until its roaming, far-outreaching laterals or side roots could take up the forage for life food. The center, or down-growing tap root has exhausted the soil life about its circumscribed self and died. Taking a lesson from the forest, prune or cut off the tap root in the nursery rows and encourage it to multiply itself and send out laterals early, since it is desirable to have an earlier return from a new planting than the forest method would give.

"In conclusion, to the would-be walnut orchardist I would say, enter upon your task with enthusiasm, tireless vigilance and ready adaptability. There lies before you a possible and a very profitable harvest of golden ducats, and a strong, clear consciousness that your world is the richer for your efforts."

On the occasion of the planting at Salem of the first Franquette walnuts grown on grafted trees, J. R. Shepard, who always has something good to say, said:

"One advantage resulting from long continued residence in one locality is the fact that one may watch the birth, struggle for existence, growth and final realization of established supremacy of the various industries which mark a people's greatness; and perhaps claim a part in it all. I was not present when the Creator first scattered a few seeds of the fir, cedar and spruce in the shadows of our snowcapped peaks, that have multiplied into the greatest lumber region in the world, nor when the first Chinook salmon darted across the bar into the Columbia River and literally 'laid' the foundation of our magnificent fisheries. These two industries I confess antedate my arrival upon the scene. But I was here in the early eighties when we awoke to the possibilities of prune culture, and began planting by the thousands the trees that now are making Oregon famous for its 'Oregon prune.' Well do I remember the stirring meetings of our horticultural societies and the character of information asked for. First there were questions pertaining to varieties, distance apart to set trees; then how early should we let them bear, and how to prune, and finally, about markets. I have watched the prune industry from below the ground up to its present magnificent condition, and am proud to say that today Salem, Oregon, has a deserved reputation as the center of the finest prune district anywhere and the home of the most famous brand in existence. Another interest, that of dairying, is yet in its infancy, and we are watching with keen interest the growth of the young giant that promises to rejuvenate the impoverished wheatfields and pocketbooks of the farmers of the Willamette Valley. Gentlemen, today I am glad to join with you in celebrating the birth of another great industry, that of walnut culture. There has been some helter-skelter, bushwhacking method of selling and planting of walnuts in the Willamette Valley, and with little intelligence, save in two or three instances, the result of which is likely to prove very disappointing in the next few years. The Oregon Nursery Company, with prophetic vision to foresee, and the wisdom and energy to execute, has grasped the situation, and today has laid scientifically the foundation of an industry that prom-



Courtesy Oregon Agricultural College

1 JUGLANS NIGRA 2 JUGLANS MANCHURIA 3 JUGLANS NIGRA
4 JUGLANS SIEBOLDIANA 5 JUGLANS CALIFORNIA
(Natural size)

THE McMINNVILLE NATIONAL BANK
Of McMinnville, Oregon

ises to take its place with those I have already mentioned. Who can estimate, gentlemen, the future greatness of a state excelling in its fisheries, its lumber, its dairying, its fruit and its walnut groves, as well as in several other respects? Now I wish to add just a word in commendation of the gentlemen who have tendered this banquet. While naturally they hope to realize a fair financial return for their labors, they have a reputation at stake, and will make it possible for the people of the Northwest to raise here one strain of walnuts, and that the best strain, which will go out in carload and trainload lots. These men, let us hope, represent the typical Oregonian of the future, a distinction we may all covet."

VIEW OF ONE HUNDRED ACRES AND BUILDINGS PURCHASED FROM THE WALNUT GROVE COMPANY BY THE SCHOOL TRUSTEES OF THE EPISCOPAL CHURCH

Mr. Charles A. Park, commissioner of the Oregon State Board of Horticulture, warned purchasers against promiscuous walnut tree sellers. He said purchasers must be careful about the walnut trees they buy, else they may lose years of valuable time in getting into the industry, and that they had better pay $2.50 for grafted trees than 15 cents for some that have been offered for sale; that the purpose of planting walnut trees is to produce a good commercial nut, one that would command the best of prices and one that is first sought by the buyers. We may see the day, he said, when nuts of first quality will command a cent per pound in advance of any of inferior quality, and that cent may be all the profit there is in growing the nuts. Any nursery that will handle only the varieties that will give the best results in this climate and refrain from handling the inferior varieties is to be commended, for they are the benefactors who will do this valley incalculable good.

Mr. Lloyd T. Reynolds, ex-commissioner of the Oregon State Board of Horticulture, called attention to the great opportunities for development in the industry of raising walnuts. The United States, he said, imported in the year ending June 30, 1905, 21,347,140 pounds of walnuts, and the amount imported is increasing rapidly from year to year. As an indication of what may be done he cited the prune industry. Not very many years ago the United States was importing regularly great quantities of prunes, most of them of inferior quality. Now we have become exporters of prunes on a large scale, our exports for the year ending June 30, 1905, being 54,993,849 pounds. In due course of time the United States will be exporting walnuts.

Ex-Governor T. T. Geer was especially pleased at the inauguration of walnut growing, because it will aid to diversify agriculture here, and this is what we need more than any other one thing.

Mr. H. S. Gile said that the growth of consumption of walnuts in the United States is rapid, and the amount used has doubled within a few years. In Salem four times as many are used now as were a few years ago, and they are now being received in carload lots.

Mr. J. H. Albert said he had a Franquette walnut tree in his yard which had never been cultivated. It was then eighteen years old and the previous year had borne four bushels of nuts.

In concluding Mr. McDonald predicted that within a few years the Willamette Valley would be shipping carloads and trainloads of Franquette walnuts.

A fine lot of photographs were taken of the nuts, the planting of the nuts, and other interesting features of the day's work.

The public celebration of the planting of these nuts was a happy conception of the management of the Oregon Nursery Company. Publicity is the order of the day, and the nursery company has taken extraordinary pains to give the public the fullest possible opportunity to learn all about these nuts and to see that they were just what they were represented to be. The 5,000 pounds of nuts planted April 14 should result

Courtesy Oregon Agricultural College

VIEW IN ORCHARD OF MR. PRINCE, SHOWING THE ARRANGEMENT OF WALNUTS AND PRUNES EVERY OTHER ROW IS SET TO WALNUTS. EVERY THIRD OR FOURTH ROW WOULD BE BETTER THUS ALLOWING FIFTY FEET BETWEEN TREES

in 125,000 trees. There will not be in existence anywhere any other stock of trees grown from nuts raised on grafted trees of the Franquette or any other hardy variety which can compare in magnitude with this.

The Franquette walnut possesses distinct characteristics. The tree is very hardy, withstanding the cold winters of Eastern France, where it was originated. It is a clean, vigorous grower, has never been attacked by disease, is a late bloomer, escaping late frosts, and a regular and abundant bearer. The hull or outside covering of the nut is much thicker than on the soft shell varieties, and consequently the nuts do not sunburn during hot spells, when most other varieties burn very badly.

Courtesy Oregon Agricultural College
A FIELD OF YOUNG CALIFORNIA BLACK WALNUTS ON THE PRINCE ESTATE

The Franquette is the ideal nut for dessert and confectionery use. It is of large, uniform size, long in form, and has a smooth, well filled shell of medium thickness, which insures its safe shipment to market. Being long in form, it carries from one to two ounces more meat per pound of nuts than the round or chunky sorts. Its pelicle is pale yellow in color; meat of exquisitely rich, oily, nutty flavor.

The Franquette is the peer of all French varieties and the heaviest bearer, unlike the Mayette, which produces a nut of fair quality but is a decidedly shy bearer, nor like the Proeparturien or other early blooming, soft shell varieties, which only occasionally bear a crop of nuts of mixed sizes and inferior quality.

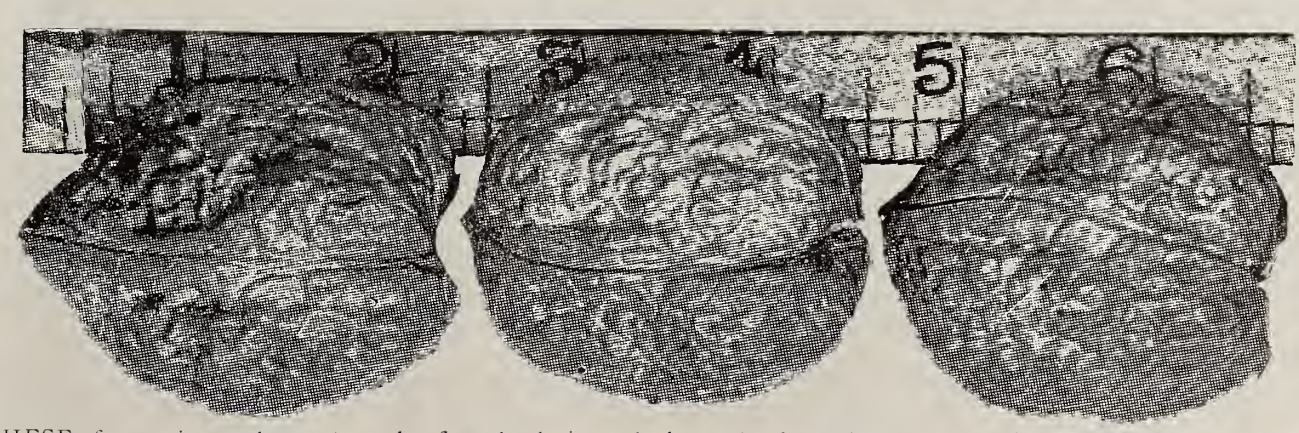
The tender, soft shell varieties that have been planted in Southern California must be left severely alone in the North, if we wish to be assured of an annual and successful crop, because the trees of the soft shell kinds are not hardy enough to withstand our coldest winters, and because they bloom so early that they are almost sure to be caught by the frost.

As French nurserymen and dealers cannot guarantee their stock to have been produced from the original trees of the variety sold, can one afford to plant trees from French stocks which may include many types and varieties under one name, on the presumption that the trees produced from these nuts will be second generation and uniformly adhere to their type? We think not. To do so would surely be a great injury to the future of this industry and one that could not be remedied in a lifetime, entailing a loss of thousands of dollars to walnut growers of the Willamette Valley and the Northwest.

Planters will readily appreciate the importance to the Northwest, at the commencement of planting of commercial groves, of securing the very best strain of the Franquette variety obtainable anywhere, so that when these trees come into bearing and the walnuts are ready for marketing they may be sold as a distinct strain at a much higher price than stock grown on indiscriminate seedling trees.

Judge Leib of San Jose, California, who has made a special study of the walnut in every condition for several years, has obtained samples and definite particulars from many American and foreign growers, and together with a careful personal inspection of the best orchards of California, has after the most severe tests concluded that for growing in Northern and Central California but two varieties need be considered, the Franquette and the Santa Rosa. He says: "The Franquette, being a well known late blooming French walnut, grown in grafted orchards; the Santa Rosa, grown mostly by seedlings, but on account of its tendency to start early in the spring, even in California not con-

Continued on page 46



THESE first prize walnuts (actual size) were grown at North Yamhill, Oregon, by E. E. Morgan, president of the Walnut Grove Company, owners of the oldest and finest bearing walnut grove, the largest plantings, and the only demonstrated walnut groves now offered for sale in the State of Oregon. By "demonstrated groves" we mean: first, land situated above the frost line, which has already produced first prize walnuts; and secondly, trees which are grafted with wood selected out of our best bearing walnut trees, on which we have kept careful, tabulated records for several years, both as to their blooming, pollination, and bearing qualities. We sell these five-acre walnut groves, with fruit trees in alternate rows, two years old, every tree now in full leaf and its life guaranteed, on easy terms, including five years' care of trees. Best buy on the Pacific Coast. Our illustrated walnut book is free for the asking.—

The Walnut Grove Company

228 Stark Street Portland, Oregon

TREATISE ON POLLINATION OF APPLE BLOSSOMS

CONTINUED FROM JULY EDITION. BY C. I. LEWIS AND C. C. VINCENT, EXPERIMENT STATION, CORVALLIS, OREGON

Temperature of Bags

To determine if there was any difference in the temperature within a wet and dry bag, and the temperature on the outside, a record was kept of the temperature at different intervals throughout a certain period. The following table indicates the results obtained:

TABLE II.—TEMPERATURE TESTS

Condition	Time	Temp.	Time	Temp.
Dry	11 o'cl'k	72° F.	12 o'cl'k	89° F.
Wet	11 o'cl'k	79° F.	12 o'cl'k	90° F.
Temp. in open	11 o'cl'k	70° F.	12 o'cl'k	83° F.

Whenever it was possible, from fifty to one hundred bags were placed on each variety. Many investigators have seriously questioned the effectiveness of the bagging process in determining the sterility or fertility of a variety. In order to demonstrate the effectiveness, bagging experiments were conducted in the following manner. Fifty bags were placed upon the variety in hand and were not molested in any way until after the petals fell from the blossoms. Then the bags were removed. Another fifty bags were placed on at the same time and when the blossoms opened and the anthers became ruptured, each of the fifty bags was removed and the pollen found in that cluster was actually transferred by hand to the pistils. The pollen was placed on the stigmas by a camel's hair brush, each variety having its own brush. In this way we have a check on "hand" versus "bag" pollination. The table is explained as follows. The first column contains the variety operated upon. The second column represents the number of bags placed on each variety. The third shows the number of fruits that set when the pollen was transferred to the pistils by hand, while the fourth indicates the number that set when the bags were not molested in any way. Table III demonstrates the value of this check.

The results show very conclusively that varieties naturally self-fertile are abundantly able to fertilize their pistils without artificial aid. In some instances only two or three blossoms set fruit out of the one hundred clusters enclosed. With these varieties it indicates that their capability for self-pollination is slight. In all cases where there were more than one blossom that set in a cluster, they were thinned to one fruit. This was done in order to give the self-fertile fruits an equal show with the crossed. Certain conditions, such as the general health of the tree, or the defective viability of the pollen of these varieties, may have caused such a low per cent to set fruit.

Other varieties were very prolific, and set an abundance of fruit with their own pollen. In many cases the pollen apparently caused the fruit to develop without formation of seeds. Plate XII, Figures 2 and 3, as illustrated on page 29, shows the Keswick Codlin, a self-fertile variety that developed full sized fruit without fecundation of the ovary, being absolutely seedless. Plate XII, Figure 1, shows the same variety crossed with foreign pollen, having many plump large seeds. A few of the self-fertile Keswick Codlin apples (Figure 2) obtained a large size, but the majority of them were small, as seen in Figure 3. While there are some self-fertile varieties, such as the Longfellow and Scott's Winter, that produced a large number of seeds, a majority of fertile and partially fertile varieties were seedless or produced only a few seeds. The apples crossed with foreign pollen had large plump seeds, and none of the apples compared were nearly so deficient in seeds as those self-pollinated.

In all there were eighty-seven varieties of apples tested for their sterility and fertility, and of these fifty-nine varieties were found to be self-sterile, that is, unable to set fruit when self-pollinated. This experiment has shown that a large majority of our apples depend upon cross-pollination. Fifteen varieties were found to be self-fertile and able to pro-

TABLE III.—SELF-STERILE AND SELF-FERTILE VARIETIES

VARIETY	Number Bags	No. Set Hand Pollenized	No. Set Bag Pollenized	Total Fruits Set	Pollen Bearers
Arkansas Black	100	none	none	none	Medium
Autumn Sweet	50	none	none	none	Medium
Baldwin	200	5	9	14	Medium
Bailey's Sweet	100	17	6	23	Medium
Ben Davis	100	2	1	3	Medium
Bethlehemite	50	4	6	10	Abundant
Bietigheimer	50	none	none	none	Shy
Bellflower (Yellow)	50	none	none	none	Medium
Bottle Greening	50	none	none	none	Medium
Canada Sweet	50	none	none	none	Medium
Canada Reinette	50	none	none	none	Abundant
Colvert	100	5	2	7	Shy
Canada Red	50	1	none	1	Medium
Delaware	100	none	none	none	Medium
Domine	100	none	none	none	Medium
Dutch Mignonne	50	none	none	none	Medium
Ewalt	100	none	none	none	Abundant
Early Strawberry	50	none	none	none	Abundant
Fallwine	100	9	14	23	Shy
Fallawater	100	none	none	none	Medium
Fall Jenneting	100	2	1	3	Shy
Great Bearer	100	none	none	none	Abundant
Grimes Golden	100	11	3	14	Shy
Gravenstein	50	none	none	none	Shy
Golden Sweet	100	none	none	none	Medium
Gano	50	none	none	none	Abundant
Green Sweet	100	none	none	none	Abundant
Hoover's Red	50	none	none	none	Medium
Haas	100	none	none	none	Abundant
Holland Beauty	50	none	none	none	Abundant
Holland Pippin	100	none	none	none	Abundant
Hydes Keeper	50	none	none	none	Medium
Hanwell Souring	50	none	none	none	Abundant
Jonathan	200	none	none	none	Medium
Jewett's Red	50	1	2	3	Medium
King of Tompkins County	100	none	none	none	Abundant
Keswick Codlin	50	24	16	40	Shy
Longfellow	100	13	14	27	Abundant
Limbertwig	100	none	none	none	Medium
May	100	none	none	none	Abundant
Melon	50	none	none	none	Medium
McMahon White	100	none	none	none	Shy
Melon Sweet	50	none	none	none	Medium
Munson Sweet	50	none	none	none	Shy
Maiden's Blush	100	none	none	none	Medium
Missouri Pippin	50	none	none	none	Medium
Mammoth Black Twig	100	none	none	none	Abundant
Mann	100	2	none	2	Abundant
Montreal Beauty (Crab)	100	none	none	none	Medium
Newtown	100	41	25	66	Medium
Ortley	100	none	none	none	Medium
Oldenburg	100	3	2	5	Medium
Paradise Sweet	100	none	none	none	Medium
Pumpkin Russet	100	8	8	16	Medium
Pryor's Red	50	2	none	2	Abundant
Pewaukee	50	none	none	none	Medium
Red Golden Pippin	50	none	none	none	Medium
Rambo	100	1	1	2	Shy
Romanite	100	none	none	none	Abundant
Rome Beauty	100	none	none	none	Abundant
Red Cheek Pippin	100	none	none	none	Medium
Ralls	100	none	none	none	Medium
Rhode Island Greening	100	none	none	none	Medium
Sweet Bough	50	none	none	none	Medium
St. Lawrence	100	none	none	none	Medium
Stark	100	1	none	1	Medium
Salome	100	none	none	none	Medium
Scott's Winter	100	20	17	39	Medium
Summer Queen	100	none	none	none	Abundant
Shiawassee	100	11	12	23	Shy
Summer Permain	50	none	none	none	Shy
Steel's Red	50	none	none	none	Medium
Spitzenberg	100	3	4	7	Medium
Tolman Sweet	100	none	none	none	Abundant
Transcendent Crab	100	none	none	none	Shy
Trumbull Sweet	100	none	none	none	Abundant
Twenty Ounce	100	none	none	none	Abundant
Wagener	50	2	1	3	Abundant
Western Beauty	50	none	none	none	Shy
Washington	50	5	2	7	Medium
White Pippin	100	11	15	26	Shy
Willow Twig	50	1	1	2	Medium
Wealthy	50	none	none	none	Medium
Whitney's Crab	100	1	3	4	Medium
Winesap	100	none	none	none	Shy
York Imperial	100	none	none	none	Abundant
Yellow Transparent	25	1	1	2	Shy

TABLE IV.—CROSS-POLLINATION EXPERIMENTS WITH SPITZENBERG IN ORCHARD OF A. I. MASON

Variety Crossed	Kind of Pollen	Number Emasculated	Time Emasculated	Time Pollenized	Number Set
Spitzenberg A.....	Baldwin	100	4-27	4-30	56
Spitzenberg B.....	Ortley	100	4-27	4-30	67
Spitzenberg C.....	Arkansas Black	100	4-27	4-30	70
Spitzenberg D.....	Red Cheek Pippin.....	200	4-28	5-1	117
Spitzenberg E.....	Newtown	100	4-29	5-1	37
Spitzenberg F.....	Jonathan	100	4-29	5-1	62

TABLE V.—CROSS-POLLINATION EXPERIMENTS WITH SPITZENBERG IN ORCHARD OF M. DRAGSETH

Variety Crossed	Kind of Pollen	Number Emasculated	Time Emasculated	Time Pollenized	Number Set
Spitzenberg A.....	Newtown	100	4-30	5-2	40
Spitzenberg B.....	Arkansas Black	100	4-28	5-1	52

duce fruit when relying upon their own pollen, but when crossed with other varieties better results were obtained. Thirteen varieties can be classed as partially self-fertile. However, it is not advisable to plant them alone, as greater yields of larger and more uniform fruits are obtained by crossing.

The varieties of apples can be classified as follows:

Self-Sterile—Autumn Sweet, Arkansas Black, Bietigheimer, Bellflower (yellow), Bottle Greening, Canada Sweet, Canada Reinette, Delaware, Domine, Dutch Mignonne, Ewalt, Early Strawberry, Fallawater, Great Bearer, Gravenstein, Golden Sweet, Gano, Green Sweet, Hoover's Red, Haas, Holland Pippin, Holland Beauty, Hydes Keeper, Hanwell Souring, Jonathan, King of Tompkins County, Limbertwig, May, Melon, McMahon White, Mammoth Black Twig, Melon Sweet, Munson's Sweet, Missouri Pippin, Montreal Beauty, Maiden's Blush, Ortley, Paradise Sweet, Pewaukee, Rome Beauty, Red Golden Pippin, Red Cheek Pippin (Monmouth Pippin), Romanite, Ralls, Rhode Island Greening, Sweet Bough, St. Lawrence, Salome, Summer Queen, Summer Permain, Steele's Red, Tolman Sweet, Trumbull Sweet, Transcendent Crab, Twenty Ounce, Western Beauty, Wealthy, Winesap, York Imperial.

Self-Fertile—Baldwin, Bailey's Sweet, Bethlehemite, Colvert, Fallwine, Grimes Golden, Keswick Codlin, Longfellow, Oldenburg (Duchess of), Pumpkin Russet, Scott's Winter, Shiawassee, Washington, White Pippin, Yellow Newtown.

Partially Self-Fertile—Ben Davis, Canada Red, Fall Jenneting, Jewett's Red, Mann, Pryor's Red, Rambo, Stark, Spitzenberg, Wagener, Willow Twig, Whitney's Crab, Yellow Transparent.

Pollenizers for Spitzenberg

While it has been demonstrated by the experiments carried on that the Spitzenberg is partially self-fertile, nevertheless the percentage setting fruit, only 3 per cent, was so small that this variety can almost be classed among the self-sterile varieties, and should be cross-pollinated.

Realizing the value of determining some of the best pollenizers for the Spitzenberg—one of the leading varieties grown in this state—cross-pollenizing experiments were carried on in several orchards in the Hood River Valley. In 1907 work was conducted in orchards belonging to Messrs. Carter, Paasch, Mason and Marshall. A continuation of these experiments was carried on in 1908. Tables IV and V, explaining the work, show the variety crossed, the pollen used, the number of blossoms emasculated, the time of emasculating, the date of applying the pollen, and the number set.

Each different tree worked upon is designated by the letters of the alphabet. In the table it can be readily seen that fewer fruits set when Newtown pollen was used than with the other varieties.

Table V shows the results obtained from these experiments.

Not only will such varieties as Baldwin, Yellow Newtown, Ortley, Arkansas Black, Red Cheek Pippin (Monmouth Pippin) and Jonathan cross satisfactorily with the Spitzenberg, but it has been demonstrated by experiments carried on by this department that the following varieties, Gravenstein, Stark, Mammoth Black Twig, Hanwell Souring, Washington, Bottle Greening, Hydes Keeper, Wagener, King of Tompkins County, York Imperial and Delicious, will also successfully pollenize this variety.

In making a study of self-pollinated Spitzenberg apples it was found that they were objectionable in that they were inferior in size and ill-shapen, as compared with the crossed apples. As far as quality was concerned, there appeared to be no difference between the self-fertile and cross-pollinated apples. The blooming period of the varieties used as pollenizers, as indicated in the tables, is nearly identical with that of the Spitzenberg. Spitzenberg crosses made by Jonathan pollen resembled the Jonathan in color, while the Arkansas Black crosses took on a darker color. Crosses made by Newtown pollen were not as deeply colored as those produced by either Jonathan or Arkansas Black.

To illustrate graphically the differences in weights, expressed in grams, in fruits and seeds of the fertile Spitzenberg, as compared with the crossed, the following summary is presented for consideration:

Spitzenberg crossed with self, fruits 100 grams, seeds .13 gram; crossed with Newtown, fruits 126, seeds .65; with Arkansas Black, fruits 128, seeds .68; with Jonathan, fruits 144, seeds .70; with Baldwin, fruits 157, seeds .71.

The summary shows the difference in the average weight of the crossed fruits, also the weight of the seeds from these fruits. This experiment shows that where there is an increase in the size of the crossed fruit there is also a proportional increase in the weight of the seeds. The self-fertile Spitzenbergs were practically devoid of plump seeds.

The experiments carried on the past two years demonstrate beyond question that cross-pollination is essential in the majority of cases if a crop is insured. While these different varieties given above have been found to cross successfully with the Spitzenberg, it is probable that some of them will be more desirable than others as pollenizers. The graphic table shows that some varieties tend to give better results than others. However, other experiments are needed to demonstrate thoroughly which one of these is the best pollenizer for the Spitzenberg. In almost every case when a cross was made a larger and better fruit was produced. In determining the pollenizers for any variety it is essential that they come into blossom at about the same time or extend over a part of the period, if cross-pollination is insured. Tables IX and X show blooming periods. In selecting a good pollenizer, its pollen-producing qualities should be taken into consideration, as well as its commercial value. A good pollenizer should produce an abundance of pollen. There are, however, exceptions to this rule, for in our experiments we have found that certain varieties known to be shy pollen bearers have given excellent results when used as pollenizers. By consulting Table III the pollen-producing powers of each variety can be had.

Since the intercrossing of varieties is necessary, the placing of the pollenizers throughout the orchard is an important question. From investigations made during the past summer in the fruit sections of Oregon it was found that the growers were placing their pollenizers in this proportion:—When three varieties were being planted, they would alternate, that is, two rows of Spitzenberg, two rows of selected pollenizer, two rows of another variety, and so on throughout the orchard.

Crossing of the Yellow Newtown

In this experiment our efforts were confined wholly to the Yellow Newtown, to determine if possible whether any improvement could be made in the size, quality, flavor and color of the fruit, by crossing with different varieties. In every case where a cross was made a much larger and finer apple was obtained. By consulting Plate XIV, Figures 1 and 2, the difference is readily perceptible as to size and shape of the two apples, the self-fertile apple versus the cross-pollinated apple. The smaller apples in the picture, Figure 1, represent the self-fertile Newtown, while the larger ones, Figure 2, have been crossed with Grimes Golden pollen. A few of the self-pollinated Newtown apples were

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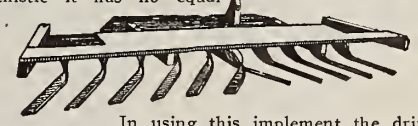
Is the one to use in all orchards. It is 8½ feet wide, very easy to guide, has a fender which prevents striking the tree with knife. No hoeing of trees where used. Two horses used on it in orchard, or for destroying fern, pink, sorrel, oats, briars and Canada thistle it has no equal



In using this implement the driver will stand in center of board, over knives, and to guide it will step to right or left, as occasion requires, and if anything should catch or gather on the knives the driver will step forward on draft board, tilt the handle forward, raising the knives, so that anything that has gathered on them may free itself. Keep all of the burrs tightened, and should any of the knives get bent out of shape force them back to place without removing them from the frame.

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normal in size, but the largest per cent of them were small. In checking up the results, out of forty self-fertile Newtown apples, thirty of them were inferior in size, when compared with the crossed apples, and contained many undeveloped seeds. Examining these apples in the laboratory only thirteen plump seeds were found.

In the college orchard, as well as in many of the orchards in the Rogue River and Hood River Valleys, a large number of small malformed apples were found. In some cases whole clusters of such apples existed. Some orchardists have claimed that aphis are responsible for such malformations, and that may be true. However, we know that in our work the aphis were not responsible, furthermore we obtained a considerable number of such apples when self-pollenizing the Newtown, while on the other hand none were noticed when cross-pollination was practiced.

This experiment would tend to show that some of our so-called self-fertile varieties could be improved by crossing, and to get the best results these varieties should not be planted in large blocks.

At this time no perceptible difference was detected in the quality, flavor and color of the self-fertile Newtown apples as compared with the cross-pollinated apples.

By studying Table VII conclusions can be drawn as to what varieties will cross most successfully with the Yellow Newtown.

In 1907 it was found that the Yellow Newtown would cross when the following varieties were used as pollenizers: Hoover's Red, Arkansas Black, Tolman Sweet, Maiden's Blush, Hanwell Souring, Pewaukee, York Imperial, Bailey's Sweet, Pumpkin Russet, Hydes Keeper, Twenty Ounce. While it has been demonstrated that all these varieties will cross with the Newtown, a series of experiments will have to be conducted, in order to determine what one or two varieties will produce the best results when used as Newtown pollenizers.

In determining the best pollenizers for any variety it is essential that a close study be made of their mutual affinities before definite results are assured. The potency of the pollen of the pollenizer on the pistillate plant must be ascertained. The action of the pollen of the pistillate plant on the pollenizer should also be known, before deciding which variety is the best pollenizer for some of our commercial varieties.

The salient points, such as the blooming period, placing of pollenizers in the orchard, commercial value of pollenizer, etc., are the same as those outlined in the discussion: "Best Pollenizers for the Spitzenberg."

To show graphically the difference in weight between the fruits and seeds of the several crosses made the following summary is presented:

Newtown crossed with self, fruits 73 grams, seeds .05 gram; crossed with Bellflower, fruits 104, seeds .40; with Spitzenberg, fruits 147, seeds .66; with Jonathan, fruits 162, seeds .65; with Grimes Golden, fruits 173, seeds .60.

From the results it can readily be seen that the self-fertile Newtowns produced decidedly fewer seeds than the crossed fruits. An increase in the weight of the crossed apples shows also a proportional increase in the weight of the seeds.

Record of Apple Cross-Pollination

The experiments conducted the past two years, emphasize the need of a study of the mutual affinities of apples, that are likely to be planted together. Not all varieties will cross with each other. For the purpose of throwing some light on this important question, a list of the successful crosses that can be made with different varieties follows:

Variety Crossed	*Variety Pollen*
Black Ben Davis	Hydes Keeper
	Willow Twig
Bottle Greening	Pewaukee
	Charlottenthaler
Blenheim Orange	Hanwell Souring
	Arkansas Black
	Jonathan
Grimes Golden	Twenty Ounce
Hydes Keeper	Tolman Sweet
Hanwell Souring	Montreal Beauty
	Charlottenthaler
Hoover's Red	Fallwine
	Pewaukee
	Maiden's Blush
Jonathan	Ben Davis
	Yellow Newtown
	Spitzenberg
Keswick Codlin	Bottle Greening
	Lady Apple
Limbertwig	Hoover's Red
	Arkansas Black
Maiden's Blush	York Imperial
Ortley	Haas
Mammoth Black Twig	Mann
	Red Astrachan
	Charlottenthaler
	Hanwell Souring
Mann	Shiawassee
	Haas
	Pumpkin Russet
Pewaukee	Hoover's Red
	Arkansas Black
	Fallwine
	Hanwell Souring
Steele's Red	Pumpkin Russet
	Hoover's Red
	Yellow Newtown
Summer Permain	Salome
	Hanwell Souring
Tetofsky	Mann
	Haas
Winesap	Arkansas Black
Shiawassee	Early Strawberry
	Sweet Bough
	Tetofsky
Washington	Oldenburg
	Hydes Keeper
	Charlottenthaler

Blooming Period

A point of vital importance to the fruit grower who contemplates growing varieties for commercial purposes is a knowledge of the relative blooming periods of the different varieties planted for cross-pollination. If they do not blossom at the same time, pollination cannot take place, and as varieties tend to be self-sterile with their own pollen this question needs considering. In every locality where fruit growing has become a specialty, the blooming periods of the different kinds of fruit should be known. Study this question and plant only varieties that blossom at about the same time.

The constancy of the relative blooming periods should receive careful study. This phase of the subject is influenced very materially by the climatic conditions. Rain, snow, cold winds, during the early part of Spring will retard the blooming period very much, while warm weather during the early Spring months has a tendency to hasten the blooming period, thus shortening it materially.

Whether or not varieties blossom at approximately the same period in the different localities of the state is a question that needs investigating. In the eighth biennial report of the Oregon

TABLE VII.—CROSS-POLLINATION EXPERIMENTS WITH YELLOW NEWTOWN

Variety Crossed	Kind of Pollen	No. Emas.	Time Emas.	Time Pollenized	No. Set	Per cent Set
Newtown A	White Pippin	20	4-25	4-25	15	75
Newtown B	Grimes Golden	57	4-25	4-25	32	56
Newtown C	Jonathan	14	4-30	4-30	11	78
Newtown D	Ben Davis	22	4-30	4-30	19	86
Newtown E	Spitzenberg	32	4-30	4-30	15	46
Newtown F	White Bellflower	14	4-30	4-30	13	23

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Board of Horticulture for 1905, Professor Lake says:—"Records kept at other places within and without the state show that the periods of blooming of certain varieties do not remain invariable." This difference in the blooming periods of certain varieties may be attributed to several causes. The location, site, exposure of the orchards containing these varieties could very easily have caused this variation.

The past two years, in co-operation with the United States Department of Agriculture, a record of the blooming periods of the different varieties grown in the college orchard has been kept, to ascertain what varieties blossom at about the same time. In the following summary the blooming period of ninety-five varieties of apples; thirty-one varieties of pears, and seventeen varieties of cherries are given. From the observations made it was found that apples remain in blossom thirteen days, pears eleven days, and cherries ten days. In different localities these dates would vary.

APPLES

Early Bloomers—Bethlehemite, April 13 to 26; Canada Sweet, April 15 to 28; Domine, April 12 to 23; Early Strawberry, April 13 to 23; Fallawater, April 15 to 27; Gravenstein, April 11 to 23; Great Bearer, April 12 to 21; Haas, April 11 to 22; Hanwell Souring, April 15 to 28; Longfellow, April 15 to 25; Limbertwig, April 15 to 27; Montreal Beauty (Crab), April 12 to 23; Mann, April 15 to 25; Oldenburg (Duchess of), April 11 to 22; Oregon Crab, April 7 to 20; Ortley, April 15 to 28; Red Astrachan, April 11 to 20; Stark, April 15 to 27; Tetofsky, April 10 to 24; Transcendent (Crab), April 5 to 16; Wolf River, April 15 to 27; Wealthy, April 15 to 26; Whitney (Crab), April 13 to 27.

Late Bloomers—Arkansas Black, April 20 to 27; Autumn Sweet, April 16 to 29; Bailey's Sweet, April 18 to 28; Bietigheimer, April 16 to 26; Bottle Greening, April 17 to 27; Ben Davis, April 22 to May 1; Baldwin, April 23 to May 1; Canada Reinette, April 20 to 29; Canada Red, April 16 to 29; Charlottenthaler, April 16 to 24; Colvert, April 18 to May 1; Dutch Mignonne, April 20 to 30; Delaware, April 20 to 29; Ewalt, April 21 to May 1; Fameuse, April 18 to 25; Fall Jenneting, April 16 to 27; Gano, April 22 to May 1; Green Sweet, April 20 to 28; Grimes Golden, April 20 to 27; Golden Sweet, April 18 to 27; Holland Beauty, April 20 to May 1; Hyslop (Crab), April 16 to 23; Holland Pippin, April 22 to May 2; Hyde's Keeper, April 20 to 27; Hoover's Red, April 18 to May 1; Jonathan, April 22 to May 2; Jewett's Red, April 20 to May 1; King of Tompkins County, April 17 to 29; Keswick Codlin, April 18 to 28; Kentucky Red Streak, April 18 to 25; Mammoth Black Twig, April 18 to 28; Martha (Crab), April 19 to 25; Melon, April 22 to 28; Missouri Pippin, April 22 to May 2; McMahon's White, April 17 to 28; Melon Sweet, April 22 to May 1; Maiden's Blush, April 20 to 30; May, April 22 to 30; Munson Sweet, April 22 to May 1; Newtown (Yellow), April 20 to May 2; Northern Spy, April 22 to 30; Pewaukee, April 18 to 28; Paradise, April 20 to 27; Pryor's Red, April 20 to May 1; Pumpkin Russet, April 17 to 30; Ralls, April 18 to 28; Romanite, April 18 to May 1; Rhode Island Greening, April 20 to May 1; Rome Beauty, April 22 to May 2; Rambo, April 20 to May 1; Rock Pippin, April 20 to 30; Red Cheek Pippin, April 20 to 29; Spitzenberg, April 20 to May 1; Salome, April 16 to 27; Shiawassee, April 17 to 26; Steele's Red, April 18 to 30; Scott's Winter, April 20 to 30; Summer Queen, April 19 to 30; Sweet Bough, April 18 to 28; St. Lawrence, April 20 to 28; Twenty Ounce, April 17 to 29; Trumbull Sweet, April 20 to 28; Tolman Sweet, April 22 to May 1; White Pippin, April 16 to 26; Washington, April 16 to 29; Walbridge, April 20 to May 2; Western Beauty, April 18 to May 1; Willow Twig, April 18 to May 1; Wagener, April 18 to 30; Winesap, April 20 to May 2; York Imperial, April 22 to May 2; Yellow Transparent, April 20 to 27.

PEARS

Early Bloomers—Clairgeau, April 6 to 13; Goodale, April 2 to 12; Kieffer, March 29 to April 11; Lincoln, April 6 to 16; Lawrence, April 6 to 14; Le Conte, March 29 to April 8; Louise, April 7 to 16; Madeleine, April 7 to 13; Mount Vernon, March 29 to April 11.

Late Bloomers—Anjou, April 8 to 13; Angouleme, April 9 to 15; Bloodgood, April 8 to 14; Bordeaux, April 8 to 15; Chenille, April 11 to 19; Clapp Favorite, April 12 to 18; Easter Beurre, April 8 to 16; Flemish, April 10 to 15; Giffard, April 8 to 15; Howell, April 8 to 15; Idaho, April 12 to 19; Lucrative, April 12 to 18; Longworth, April 13 to 20; Old Home, April 11 to 16; President, April 11 to 17; Patrick Barry, April 8 to 18; Seckel, April 11 to 16; Souvenir, April 9 to 15; Tyson, April 9 to 18; Vicar, April 8 to 13; Winter Nelis, April 9 to 20; White Doyenne, April 8 to 15.

CHERRIES

Early Bloomers—Early Purple Guigne, March 31 to April 10; Elton, April 5 to 13; Governor Wood, April 3 to 12; Knight's Early Black, April 2 to 11; Lincoln, April 5 to 13; Luelling, April 7 to 13; Rockport Bigarreau, April 7 to 14; Van Wick's Early, April 7 to 14.

Late Bloomers—Coe Transparent, April 8 to 17; Morello, April 11 to 18; May Duke, April 13 to 21; Major Francis, April 10 to 16; Montmorency, April 12 to 19; Napoleon Bigarreau (Royal Anne), April 11 to 19; Windsor, April 11 to 17; Willamette, April 8 to 15; Waterhouse, April 10 to 18.

The varieties given in these tables are grouped as early and late bloomers. This classification is made according to the appearance of the first blossom.

Summary

The contents of this bulletin can be summarized as follows:

First—It was due to early writers, such as Sprengel, Knight and Darwin, that light was thrown upon pollination problems. This work served as a stimulus for horticulturists to investigate these problems.

Second—The unsatisfactory method of emasculating the blossom has been one of the principal reasons why pollination experiments have not been conducted on a larger scale. A system of emasculation is outlined in this bulletin which greatly facilitates matters, allowing for greater rapidity in making the operation, and insures against mutilation of the blossom and malformation of the fruit.

Third—The small camel's hair brush is a practical and efficient way of aplying the pollen to the stigmas of the pistils. Considerable controversy has arisen as to the time of making the application. We have obtained very satisfactory results by applying the pollen at the time of emasculation.

Fourth—The question of collecting an adequate supply of pollen for pollination purposes is a serious one. A solution to this problem is found by resorting to the forcing house. Here pollen can be ripened quite rapidly.

Fifth—One of eighty-seven varieties of apples worked with, fifty-nine varieties were found to be self-sterile, fifteen varieties self-fertile, and thirteen varieties partially self-fertile.

Sixth—Many varieties of apples naturally tend to be self-sterile when limited to their own pollen.

Seventh—Results indicate that cross-pollination is the rule, and self-pollination the exception.

Eighth—A knowledge of the mutual affinities between the different varieties must be gained.

Ninth—Some pollenizers for the Spitzenberg have been ascertained. Sixteen varieties of apples were found to cross successfully with this variety. A few, such as the Yellow Newtown, Ortley, Arkansas Black, Jonathan, Baldwin and Red Cheek Pippin (Monmouth Pippin), are very promising.

Tenth—In some instances the immediate effects of pollen on the color of the fruit were perceptible.

Eleventh—With an increase in the weight of the crossed apple, there was a proportional increase in the weight of the seeds.

Twelfth—The action of foreign pollen on the Yellow Newtown, a self-fertile variety, was very pronounced.

Thirteenth—Many of the self-fertile varieties of apples, when self-pollinated, were found to be seedless or devoid of plump seeds.

Fourteenth—An improvement in the size of the self-fertile varieties can be made by crossing.

Fifteenth—Out of eighteen varieties that we have found to cross with the Yellow Newtown, a few, such as Spitzenberg, Jonathan and Grimes Golden, have given excellent results.

Sixteenth — The pollen-producing powers of eighty-seven varieties of apples are given.

Seventeenth—For twenty different varieties of apples some pollenizers have been determined.

Eighteenth—Wind is a poor agent in transferring pollen from tree to tree. Bees and insects appear to be the principal pollen distributers.

Nineteenth — The floral envelope serves to attract the attention of the bees. They will, however, to a certain degree, visit blossoms where floral envelope has been removed.

Twentieth—The blooming period is given of ninety-five varieties of apples, thirty-one varieties of pears, and seventeen varieties of cherries. A classification into early and late bloomers is made, showing what varieties will blossom together for cross-pollination.

Twenty-first — Climatic conditions influence, to a certain degree, the relative blooming periods of the different kinds of fruits.

Twenty-second—Where frost is prevalent varieties can be selected with reference to their time of blooming, thus partially eliminating the difficulty of a failure of fruit.

Twenty-third — It was found that pollen was capable of maintaining its viability for three weeks, provided it was not allowed to ferment.

Twenty-fourth—Length of time different kinds of fruit remain in blossom at this station are as follows: Apples, thirteen days; pears, eleven days; cherries, ten days.

PLATE XIV.—FIGURE 1. SELF-POLLINATED NEWTOWNS, PRODUCING AT LEAST ONE-THIRD OF THE APPLES UNDER SIZED. FIGURE 2. YELLOW NEWTOWN POLLINATED WITH GRIMES GOLDEN. NO SMALL APPLES

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THE Oregon State Fair, which has always been a splendid success, will be held again at Salem this year from September 13 to 18. This fair is of particular interest to the fruit growers on account of the splendid horticultural exhibits. It is something that every fruit grower should attend. We regret our information about the fair is so late that we are not able to give more space in this issue. We will have more to say about it in the September number, but our advice to every fruit grower who can get away is to attend the Fair.

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ON account of the increased interest which is being taken in the walnut industry, we have for some time felt that a special edition of "Better Fruit" on this subject would be interesting and valuable to a great many people. It has been our earnest endeavor to do the subject justice to the best of our ability in this issue, and we claim and believe that in this August edition of "Better Fruit" we have produced the handsomest and most complete, the most interesting and instructive piece of literature that has ever been published about walnuts and walnut growing, and it is with considerable pleasure that we submit it to the public for their approval and criticism.

◈ ◈ ◈

FOR SALE, BY OWNER

Eighty acres of land in best section of White Salmon Valley, only one and one-half miles from station of Underwood, Washington, on the new Spokane, Portland & Seattle Railway. About twenty acres cleared and in cultivation. Spitzenberg and Winter Banana apples in third year of growth. Nine or ten acres of Clark Seedling strawberries, giving handsome returns. Orchard of peaches, prunes, cherries, pears and grapes. Large tract of finest beaver-dam land, suitable for celery, asparagus, melons, etc. An abundance of water for domestic use and irrigation. New two-horsepower gasoline engine, large capacity pressure pump, six hundred feet of two-inch galvanized iron pipe, fire hose, etc. New 1,500-gallon patent redwood tank on thirty-foot tower. New house, with cellar and six rooms, including four bedrooms, kitchen and splendid living room 18x26 feet in size, with fine large

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By Mountain Streams, Apple Orchards
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Connects with O. R. & N.
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Special Attention to Commercial Men, Camping & Fishing Parties
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HOOD RIVER, OREGON

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" " " Quality " Better
" " Having Both " Best
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"Business Training in Business Methods by Business Experts"
Behnke-Walker
The Leading Business College
Portland, Oregon

160 Acres vs. Five Acres

WHY will a farmer continue to work a quarter section or more of land, employ several farm hands, buy expensive machinery *and take no larger profits* than a man working a five acre tract and supplying all the labor necessary with his own hands?

We are placing on the market the historical and fertile old Broadmead farm site situated in Yamhill and Polk Counties on the Southern Pacific. It's the opportunity you have been looking for to settle down and make a comfortable, easy living and provide for the future of your family. Five and ten acre tracts at from $100 to $150 per acre.

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fireplace. A bathroom complete with best porcelain fittings, tub, watercloset and wash basin. Hot and cold water. There is also good sized log house and necessary tool houses, packing sheds, etc. Fine team of horses, hack and wagon and necessary tools go with place. For price and terms address F. S. Forest, Underwood, Washington.

◈ ◈ ◈

FAIR DATES

North Pacific Fair Circuit—Everett, Aug. 30-Sept. 4; Salem, Sept. 13-18; Portland, Sept. 20-25; Seattle, Sept. 27-Oct. 9; Spokane, Sept. 20-25; Walla Walla, Oct. 4-9; Boise, Oct. 11-16.

Willamette Valley Circuit—McMinnville, Aug. 25-27; Scio, Aug. 30-Sept. 1; Albany, Sept. 2-4; Eugene, Sept. 8-11; Canby, Sept. 30-Oct. 8.

Short Line Fair Circuit—Dillon, Montana, Aug. 31-Sept. 3; Pocatello, Idaho, Sept. 6-9; Blackfoot, Idaho, Sept. 14-18; St. Anthony, Idaho, Sept. 21-25; Montpelier, Idaho, Sept. 28-Oct. 1.

California Circuit—San Diego, July 5-10; Los Angeles, July 19-24; Fresno, July 26-31; Salinas, Aug. 2-7; Pleasanton, Aug. 9-14; Woodland, Aug. 16-21; Chico, Aug. 23-28.

State Fairs—Salem, Oregon, Sept. 13-18; Denver, Colorado, Sept. 12-18; Sacramento, California, Aug. 30-Sept. 4; Boise, Idaho, Oct. 11-16.

Horse Shows, Field Events, District and County Fairs—Roseburg, Oregon, Sept. 2-4; Centralia, Washington, Sept. 6-11; Baker City, Oregon, Sept. 21-25; Pendleton, Oregon, Sept. 27-Oct. 2; Riverside, Washington, Sept. 29-31; Lewiston, Idaho, Sept. 27-Oct. 2; Burns, Oregon, Oct. 5-9; The Dalles, Oct. 5-9; Prineville, Oregon, Oct. 4-9.

British Columbia Circuit—Victoria, Sept. 20-25; New Westminster, B. C., Oct. 12-16.

Montana Circuit—Dillon, Aug. 31-Sept. 3; Bozeman, Sept. 13-18.

LAND

Apples, Peaches, Cherries and Apricots are moneymakers. Why not buy land where they grow to perfection. I have some bargains

Roe A. Deal, Springville, Utah

Cupid Flour

Has same standing in the Flour Trade that Hood River Apples have in the Fruit Trade. *Made by*

HOOD RIVER MILLING CO.

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EYES TESTED LENSES GROUND

Over 30 Years' Experience

TELESCOPES, FIELD GLASSES
MAGNIFIERS TO EXAMINE SCALE

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AND GLENWOOD, IOWA

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ESTABLISHED 1859 Oldest Bank on the Pacific Coast

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R. S. Howard, Jr., *Assistant Cashier*
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Incorporated 1905

Butler Banking Company

HOOD RIVER, OREGON

Capital Fully Paid $50,000 Surplus and Profits are $30,000

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We give special attention to GOOD FARM LOANS

If you have money to loan we will find you good Real Estate security or if you want to borrow we can place your application in good hands and we make no charge for this service

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BOOK STORE
Office Supplies
Stationery
Ledgers, Journals, Time Books
Memorandum Books
Rubber Stamps
Souvenir Postals *Picture Frames*

Better Fruit
is printed by us
We arrange and print booklets for growers of fruit, development leagues and others
F. W. Baltes & Company
PRINTERS
PORTLAND, OREGON

WALNUT CULTURE—PLANTING, CULTIVATING

Continued from page 39

sidered profitable. The Franquette seems also well adapted to some of the larger interior valleys."

With many reports from growers residing in various parts of the Northwest, and from our own personal observation, we have come to the conclusion that the flavor of the nuts, especially the French varieties grown in Western Oregon and Washington, is superior to that of nuts of the same varieties imported from France or grown in California, and certainly of much better quality than those which can be bought in the stores.

The uncertainty of a crop is often owing to the early blooming varieties planted, which start into growth at the first warm spell in the latter part of the winter, and almost invariably this tender early growth is killed by frost. Hence the trees bear no fruit.

Planting in the Northwest, until quite recently, has been limited to a small area. There is needed a tree of strong, distinct characterictics, hardy, late to start into growth, and bearing a nut of good size and best quality. These characteristics the Franquette possesses in the highest degree.

Reports from Whitman County, in Eastern Washington, where the temperature frequently falls as low as twenty degrees below zero, states that a number of Franquette trees are doing admirably,

The
Hall Drug Store
Eastman Kodaks and Supplies
Souvenirs, Postcards, Stationery
Pyrography Materials
Hood River's Largest and Best Drug Store

DID YOU
GET
YOUR COPY?
If not we will mail you our handsome
SOUVENIR BOOK
Of
STOCK FRUIT CASE
LABELS
Schmidt Lithograph Co.
408 WELLS FARGO BUILDING
PORTLAND, ORE.
Write Us Today
Our Supply
Is Limited

Malthoid
Roofing
The roofing that always makes good. No matter how big or little the job, Malthoid fits every condition and renders a roof service that is absolutely incomparable. If you want the roofing that is right—demand Malthoid. Made by the original makers of ready roofings.
THE PARAFFINE PAINT CO.
San Francisco Portland
Stewart Hardware & Furniture Company, Distributors, Hood River

producing a nut as fine as was ever produced in California.

The figures given below, obtained from the Bureau of Statistics, Department of Commerce and Labor, Washington, and covering the number of pounds of nuts imported into the United States from Europe; will quite reassure the timid planter:

Year	Shelled	Unshelled	Total
1902	2,224,879	9,702,558	11,927,402
1903	3,035,970	8,936,438	11,872,408
1904	3,579,941	19,456,012	23,033,953
1905	4,198,009	16,312,138	20,490,147

With this deficiency in our production of nuts, and an ever increasing and varied use of this nutritive and wholesome delicacy, and with our climatic conditions almost perfect, our prospects as walnut growers are unexcelled.

The Willamette Valley is especially and most fortunately adapted to this culture. On its slopes and well drained fields the nut tree will find ready sustenance, and in a decade will constitute the revenue of many a far-seeing farmer.

To be concluded in September edition

POULTRY
on a FRUIT FARM

Write for Special Information regarding Our Poultry Foods, Rations, Remedies and Supplies

LILLY'S BEST

Largest Manufacturers of
Poultry Supplies on the Pacific Coast

Practical chicken men universally concede
OUR LEADERSHIP

SPECIAL ATTENTION to Fruit Specialists who are Amateur Poulterers

Write for our Poultry Book

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SEATTLE PORTLAND

The KURTZ
Fruit Dryer

Simplest, cheapest and best dryer in use in Oregon, Washington and California. Tunnel system, best system on earth. We build by contract or furnish plans and patent rights and material, wire cloth, cast iron furnaces and furnace pipes. We also manufacture the Kurtz Prune Dipping and Spreading Machine. It has no equal; saves its cost in less than one season; capacity 200 to 250 trays per hour. Write for descriptive circulars and prices

CLINTON J. KURTZ
SALEM, OREGON

The PARIS FAIR

Hood River's Largest and Best Store

DRY GOODS
SHOES, CLOTHING

We are offering some extra specials in our Clothing Department. Ask to see them

Try a pair of American Lady $3 & $3.50 Shoes or American Gentlemen $3.50 & $4

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DEALERS IN
Commercial Fertilizers
Land Plaster, Lime
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Hood River Spray Mfg. Co., Medford Spray Co., Oregon Spray Co.
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THESE FACTORIES MAKE AND DISTRIBUTE THE FAMOUS

NIAGARA
Lime-Sulphur Spray

The leading fruit growers and fruit growers' associations of the Northwest use NIAGARA exclusively. *There is a reason why.* NIAGARA is made under special process originated by ourselves. The only known process by which is made a permanent, clear and reliable solution of lime and sulphur of sufficient strength to meet all requirements. *Write for further information*

WHEREVER FRUIT EXCELS *Niagara Spray* IS USED

ROBERT T. COCHRAN & CO.

COMMISSION MERCHANTS

290 WASHINGTON STREET NEW YORK

Want Apples

CORRESPONDENCE SOLICITED *Members* International Apple Growers Association

References: D. V. Burrell, Rocky Ford, Colorado; Ozark Improvement Co., Brandsville, Missouri; Oakland Fruit Co., Van Buren, Arkansas; Georgia Fruit Exchange, Atlanta, Georgia; Aetna National Bank of New York; Commercial Agencies

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92 COMMERCIAL STREET BOSTON, MASSACHUSETTS

Apples for American and Foreign Markets

Agents for:

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Market Quotations and Full Particulars on Application Correspondence Invited

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131 SOUTH WATER STREET CHICAGO, ILLINOIS

Great Central Market

We specialize in fancy Pacific Coast and Northwestern fruit. We are general distributing and Eastern marketing agents for some of the largest associations and shippers in the Northwest. We make a specialty of selling f. o. b. in transit or delivered, whichever way will realize best results for the shipper.

If you have not already arranged for the disposition of your shipments, make us your general Eastern sales agents. Will give your business special attention.

Mr. W. C. Michael, our Northwestern representative, is well known to a large number of the shippers of that section, and will be glad to call and see you during the season.

We own our own cold storage plant, the only one on South Water Street. It is an up-to-date one with a capacity for one hundred thousand boxes of apples. This, in connection with our store, places us in the best position of any one in the fruit business to protect the interests of the shippers.

We refer you to The First National Bank, Chicago, The Chicago Packer *and the* Produce Reporter Company

A WORLD MARKET FOR NORTHWESTERN APPLES

MODERN MARKETING METHODS

REGARDLESS of the wide reputation of Northwestern apples, it is surprising how little known they are in many of the smaller sized markets of this country. The superior quality of the Northwestern apples places them in a distinct class, and the demand for such a product is susceptible of tremendous increase, provided the proper facilities are employed in the advertising, selling and distribution.

It is a fact that during the early development of the apple industry in the Northwest, New York, Chicago and other similar large cities were the principal markets used, and at that time there was no particular need to broaden the outlet. At the present time, however, a broad distribution is needed, and no grower of apples should be content with anything less than the top value for his fruit. He should retain a keen interest in the establishing of a permanent trade for his particular brands.

A very interesting and important feature of the apple selling business was emphasized during the past apple season by Crutchfield & Woolfolk, the well-known sales agents and distributors. By the aggressive work of their sales department a demand was created and developed in sections of the United States which have heretofore handled practically none of the Northwestern apple crop.

In the wealthy centers of every state in the Union a demand exists for strictly high grade fruit, and many of the buyers became enthusiastic in their praise of the Northwestern apples. In many cases the orders booked by Crutchfield & Woolfolk represented the first introduction of this fruit in these cities. Duplicate orders naturally resulted and in the handling of a very large volume of business Crutchfield & Woolfolk were able to so regulate the sale and distribution of this fruit that the competition was raised among the buyers in bidding for the fruit instead of between the shippers in seeking the markets.

A world market for Northwestern apples means something more than the shipping of the fruit to distant points. It means the development of a highly profitable demand in the smaller markets and frequently out-of-the-way cities, where a fancy article is appreciated. A development of foreign demand can be properly accomplished where proper facilities exist.

Crutchfield & Woolfolk stand foremost in the business as marketing agents for fruits. They operate in every state in the Union, with foreign branches, and the immense volume of business they handle each year places them in the most intimate touch with the trade and its requirements. They sell every class of fruit, tropical, northern, citrus and deciduous. They seek out the markets and buyers which many competitive concerns are not familiar with. A thorough and intimate knowledge of the marketing methods and detailed operation of every fruit selling organization of prominence in existence has enabled Crutchfield & Woolfolk, with their immense business, to build up during the past ten or twelve years a selling organization which, when judged by results obtained for the shipper, stands without a peer. Any fruit shipper or association desiring information concerning results on Northwestern fruit handled by Crutchfield & Woolfolk during the past season is requested to write to them at their executive offices, Pittsburg, Pennsylvania, for particulars. They will also receive a booklet on f.o.b. selling and distribution, which will prove interesting. The growers of the Northwestern district should avoid speculating with their fruit and should co-operate with such a selling agency as the above in giving their fruit a permanent reputation and established demand. In this way there is no uncertainty about the placing of their fruit each year on a satisfactory f.o.b. basis.

The above firm will be personally represented in the apple district and they would like to have the names of all shippers who would be interested in having details of a definite and satisfactory business proposition.

Write them at Pittsburg.

TREES TRUE TO NAME · The SILVA-BERGTHOLDT CO. NEWCASTLE, CAL. · PLACER NURSERIES

FRUIT TREES

ALL STANDARD COMMERCIAL VARIETIES

The best that good care can produce

Write us now concerning your Fall and Winter Planting

AGENTS WANTED

The Silva-Bergtholdt Company

121 Orchard Street Newcastle, California

Office of

The Grand Junction Fruit Growers' Association

Grand Junction, Col., July 10, 1909. We are anxious to exchange information regarding apple crop conditions, probable number of cars, quality, varieties, etc., with all boxed apple shippers, believing such information will work to our mutual benefit in establishing prices this fall. We are in a position to furnish information on the entire Colorado crop. and will gladly respond to all requests for crop reports.

Grand Junction Fruit Growers' Assn.

JOHN F. MOORE, Manager

Burpee's Seeds that Grow

140 VARIETIES ANY QUANTITY

Plenty of Stock in our 40,000 Pounds

Growing Plants as Season Requires
All Makes High Grade
Pruning Tools
Garden Tools
Hose and Spray Nozzles
International Stock and Poultry Food
International Remedies
Incubators and Brooders
Everything for Building
Everything for Furnishing

Stewart Hardware & Furniture Co.

22,000 feet floor space HOOD RIVER, OREGON

Rae & Hatfield

Largest Handlers of Pacific Coast Fruits in the East

REPRESENTING THE FOREMOST WESTERN SHIPPING COMPANIES AND ASSOCIATIONS ON THE NEW YORK MARKET

Operating in All Producing Sections

Reliable Experienced Prompt

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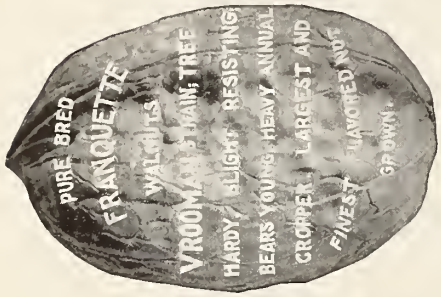
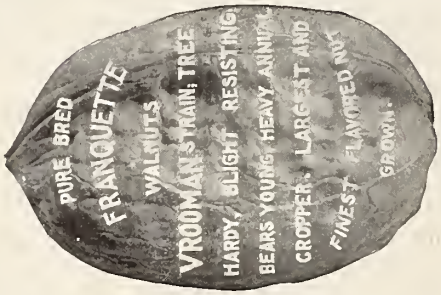
WHAT DOES V. P. B. F. STAND FOR?

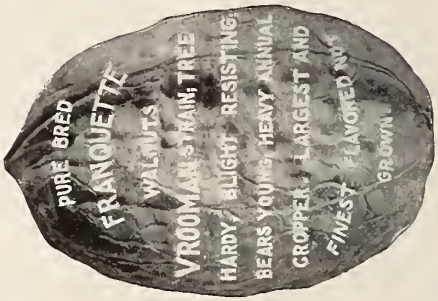
IT REFERS TO THE

VROOMAN PURE BRED FRANQUETTE WALNUT

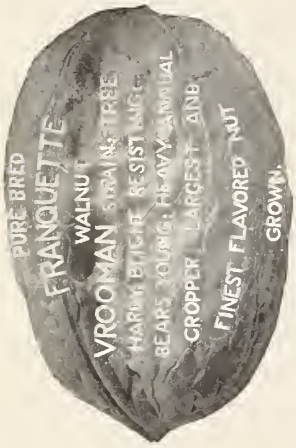
The Variety that is Being Planted more Extensively than any Other Variety of English Walnuts



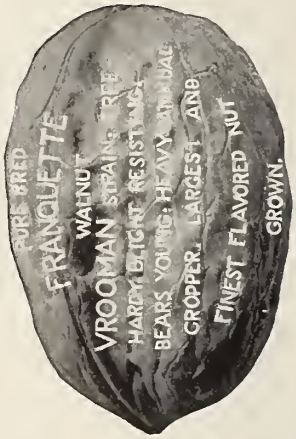




Those who are interested in English Walnut Culture, and who have investigated the merits of different varieties, invariably select the



VROOMAN PURE BRED FRANQUETTE

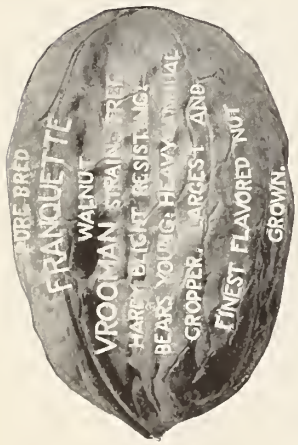


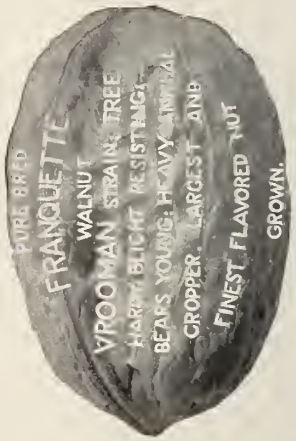
for the following reasons:

1. It is adapted to this Northern Climate.
2. It is a heavy and regular bearer.
3. It is a late bloomer, thus escaping early spring frosts.
4. The V. P. B. Franquette Walnut is of large size and well filled.
5. It has an exceedingly rich, oily, nutty, flavor.
6. The shell is of medium thickness, can be cracked with thumb and forefinger.
7. Trees are guaranteed "true to name."
8. All our scions for grafting purposes and all nuts for planting purposes come from specially selected GRAFTED TREES, thus guaranteeing uniformity of type.
9. And many other reasons which space will not permit us to enumerate, but which we'll be glad to explain fully upon request.

Our booklet on Walnut Culture explains all about the Vrooman Pure Bred Franquette and it will be sent *free* upon request. You should have it if interested in Walnuts.

In the way of APPLES, PEARS, CHERRIES, Etc., we have one of the largest stocks in the West from which to fill your orders.





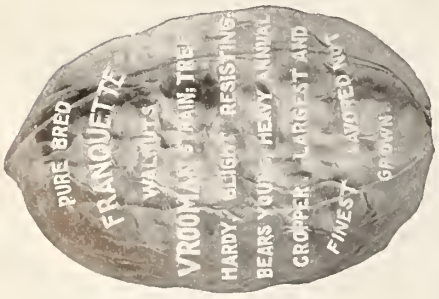
Remember Our Trees are Non-Irrigated

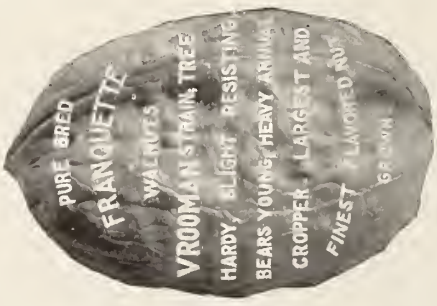
With our new and enlarged packing sheds and improved up-to-date methods, our facilities for handling your business this year, are more complete than ever. Our constant aim is

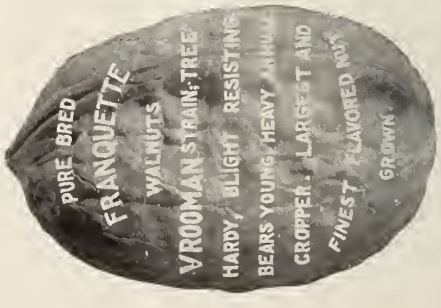
To grow the MOST and BEST trees
And sell to the MOST and BEST people

Oregon Nursery Company

Successful Salesman Wanted Salem, Oregon







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Catalogue Free

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Yakima Valley Nursery

Incorporated $60,000 Fully Paid

LARGEST STOCK OF

FRUIT TREES

in the Pacific Northwest. Special prices for large planters. *Salesmen Wanted Everywhere*

W. D. INGALLS, *President and Manager*

NORTH YAKIMA, WASHINGTON

NUTS *and* FRUITS *and* FLOWERS

Are you seeking some especially rare plants or beautiful flower? If so write to us about it. Our stock includes almost everything in hardy plants and trees for garden and orchard. Rare Japanese Plants a specialty.

Okanogan Nurseries

OMAK, WASHINGTON

F. K. Spalding, Pres. W. S. McClain, Sec.
Harry K. Spalding, Vice Pres.

The Sunnyside Nursery Company

Paid up Capital $26,000.00

The Sunnyside Nursery Company have sold practically all of their stock for spring delivery of 1909, and call your attention to the great stock they are growing for next year's trade. They will have

1,000,000 Apple Trees
200,000 Pear Trees
150,000 Peach Trees
100,000 Cherry Trees
50,000 Miscellaneous Varieties

Most complete stock in the Northwest. Write for prices

Main Office at Sunnyside, Washington
Branch Nursery at Grandview

WALNUT GROWING IN NORTHWEST DISTRICTS

BY THOMAS PRINCE, DUNDEE, OREGON

THOSE of us who have been interested in the culture of walnuts, and have trees in bearing, think we have demonstrated that the English walnut can be grown in the Northwest with profit.

In any manufacturing business, as essentials to success, are conceded, first, proper material and supplies, purchased at lowest market prices; second, the best machinery, producing as good quality and at as low cost as other manufacturers; third, placing on the market and being able to get as good prices at least as competitors; and if failure in either case, a man had better never have undertaken to do business.

And in walnut culture we believe that, first, location and soil suitable should be selected; second, trees adapted to the climate; third, good and proper cultivation in growing the trees; and if a failure in either case the venture would no doubt prove a failure.

It has been found by experience that to obtain good results ground should be selected having good drainage, and of course the deeper and richer the soil the better. A clay subsoil seems to be well adapted, but a sandy loam might be still better. In the volcanic ash of Eastern Oregon and Washington, in irrigated sections where they have been set out, young walnut trees have made remarkable growth. Where there is a cement gravel the tap root cannot penetrate and trees do not make good growth. Such soil is considered unfit for walnuts.

The late blooming French varieties prove to be suitable. Those who have undertaken to grow walnuts from the California propagated trees find they bloom too early and are cut down by frost, and a great many such trees have been and are being replaced with trees of French variety. It is a question whether to grow grafted trees or seedlings. Some of us who are growing the seedling trees and also some grafted trees find by experience that the seedling is a better growing tree and by them we are able

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FRUIT TREES
Complete stock of leading varieties of apples, pears, etc.
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to get nuts quicker in quantity. Some think that, if grafted, to graft on the French stock or its own stock, and some think the black walnut the better stock to graft upon. In California what is called California Black makes a larger tree, same age, than the Eastern Black, and when grafting they use California Black. In the Northwest the Eastern Black is the better growing tree, and no doubt is the stock to graft upon.

Those of us growing the seedling trees which are in bearing, when at harvest can produce the fine commercial product, size, appearance and quality satisfactory, feel pretty well satisfied, and question whether or not we have made a mistake by planting the seedling trees. When the seedling trees get to be good size

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PROPAGATORS OF
Reliable Nursery Stock
ALL STOCK BUDDED FROM BEARING TREES
FRUIT AND ORNAMENTAL
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That's a fair sample of the balance between the top and the root of our trees. We consider the root as the foundation and the top as the superstructure. If you don't start with a good foundation, you'll have to take time to build one before you can hope to build the superstructure, which in the case of the orchardist is the bearing tree.
Time is Money.
We have argued for years on this point, and dwelt on the superiority of our trees, grown on the Yakima Indian Reservation. The proof is in the orchards of thousands of satisfied customers all over the Northwest.
Soil rich in the elements of tree growth, long growing season, water when the young tree needs it, and incessant cultivation, all combine to produce a good healthy growth on the top and a root system unequalled by trees grown elsewhere.
We deliver your trees with the foundation. You don't have to lose a year waiting for the roots to catch up with the top. A crop one year earlier means a good deal in these days of high-priced fruits. That's just the difference between a good start and a poor one.
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and bearing and the nuts are found to be undesirable by reason of thickness of shell, size or shape, we can limb graft and get good bearing trees quicker than to grow the root grafted tree.

There should be particular pains taken in setting out the trees. A deep hole should be dug and at bottom of hole, below the roots, a forkful of rotted manure, leaf mold or something to give the tree a good start. The roots will soon find the manure. Care should be taken to straighten the fibrous roots. A man working steadily should not set more than fifteen to twenty trees per day. For the first few years there should be good cultivation. The better the cultivation the quicker you will get a good sized tree.

Walnut growing being a new horticultural product for the United States, conditions no doubt are different here than elsewhere. Therefore it will not be strange if we make mistakes, and we should compare results and profit by each other's experience. No doubt our expectations will be raised beyond what we may be able to accomplish, as many of the nurserymen and promoters of walnut land make some extravagant and unreasonable claims. Some growers will no doubt make a success and others fail, the same as with apples and other crops, and as also in different vocations. We grow a walnut in Oregon superior in quality. We have good soil and the climatic conditions favorable, and we believe this industry will prove a large and profitable one for the Northwest.

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AN INTERESTING LETTER ABOUT WALNUTS

BY T. WITHYCOMBE OF PORTLAND, OREGON

THE walnut, I believe, was first brought from Persia in Asia, yet in Persia there are very high tablelands, where the temperature is comparatively low, and the climate of some parts of Persia is no warmer than the middle of France, and the climate of the Willamette Valley is very similar to that of France, where the walnut is grown very successfully. Yet there is a condition here existing that does not exist in France, therefore, in planting the walnut tree that condition must be met, or any effort put forth in the direction of growing walnuts will become a financial failure. About twenty-five years ago this mistake was made in planting the prune, and thousands, and I may safely say hundreds of thousands of dollars were wasted. I know one gentleman who alone lost over $20,000 by that mistake; yet the small amount of prune orchards that were planted wisely have been one of the best paying properties in the valley. One native Oregonian who had cultivated an intense love for the walnut tree, having watched some his father had planted as they grew from saplings into the most beautiful trees anywhere to be seen, even went to France and studied the business from

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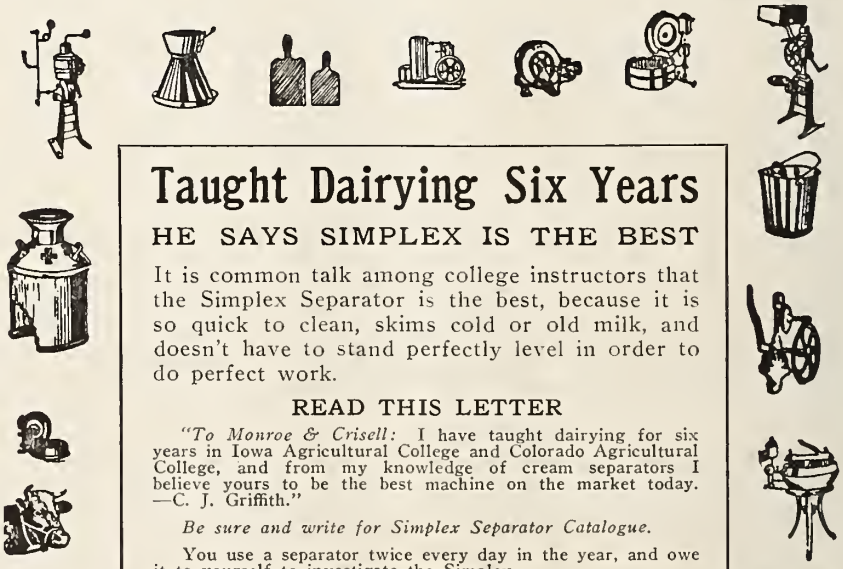

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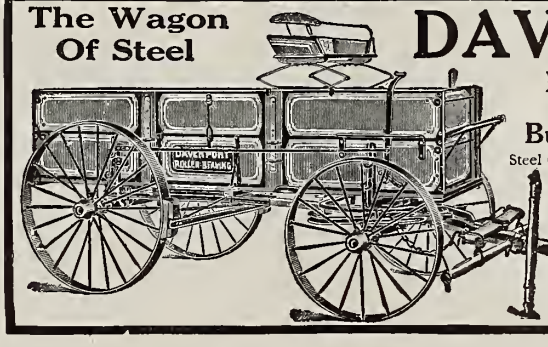
beginning to end, taking particular notice of soil conditions, kind of trees used, etc. But he had failed to take into consideration the peculiar condition prevailing here west of the Cascade Mountains. We are surrounded by beautiful, perpetually snowclad mountains, and whenever the nights become clear and the wind blows from the direction of those beautiful snow peaks, a killing frost strikes the low places and also some exposed high places. This is a condition that has brought consternation into the hearts of a good many walnut tree planters this last year, but they are again consoling themselves with the expression, "It is the worst frost we ever had or maybe ever will have." To plant under any such hopes is a very uncertain thing to do. There are locations that have not been hurt in the least by these frosts and the walnut has never failed to

The Wagon Of Steel



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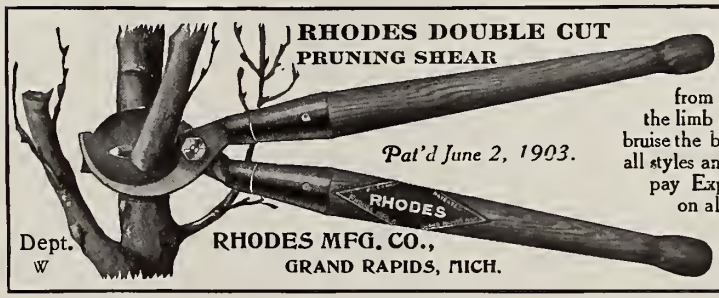

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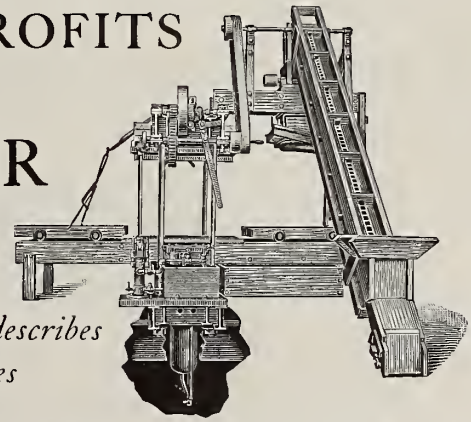

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bear full crops. I do not think it is safe to plant a walnut tree where a peach tree will not do well. By careful research it has been demonstrated that many such locations can be found in the Willamette Valley. I find that the west slopes of hills, say from 350 to 800 feet in altitude, with 200 or 300 feet above before the summit is reached, is the ideal location, if the soil is right and it is not exposed too much to the sweep of the sea breeze. A western exposure, where the sea breeze is moderate, is ideal, as the sea breeze tempers the air so as to make these slopes immune from killing frosts.

There is quite a controversy whether to plant the seedling or the grafted walnut. My experience so far leads me to the conclusion that to take the Franquette or Mayette nuts from the grafted trees and plant, and then when they come into bearing to mark all trees that do not come up to standard in quality and bearing and top-graft them, will be much better than planting the grafted trees where the stock is grafted. In a visit to Mr. Thomas Prince's orchard this became very evident to me.

Mr. F. Groner, of Scholls, Oregon, in comparing Mr. Prince's second generation trees with Mrs. Vrooman's celebrated grafted Franquette orchard at Santa Rosa, California, said the best trees in Mr. Prince's orchard were much better than the best trees in Mrs. Vrooman's orchard. This bears out the testimony of the late Mr. Gillette, of Nevada City, California, who said that the seed-

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lings from nuts from grafted trees were one-third superior to the original, one-third equal and one-third inferior. I think to change this last one-third will make the orchard all right. I feel certain the vitality of the seedling tree is most superior to the grafted tree.

The climate of Oregon is ideal for raising a walnut of the highest quality, if they are planted in locations like I have described, but if planted in the frost belt the frost of autumn will often spoil the flavor of the nuts by making them bitter.

There is difference of opinion as to whether it is better to raise an orchard from planted nuts or trees. Each method has its advocates. Mr. Gillette said the transplanted tree does the best. Experience has proven to me that the raising of crops amongst the trees is not at all a good plan. The trees and the fillers should have thorough cultivation and full possession of the ground, and the superabundance of fertility set free by cultivation and not used by the growing trees should be fixed by growing cover crops and plowing them under.

If we will plant our walnut groves in the right location and give them the proper care, the Willamette Valley some day will be as noted for its fine walnuts as Hood River is today for its apples.

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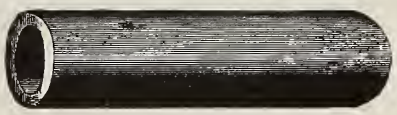

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We have the noted Blalock fruit farm of 1,500 acres.
We have the famous Dumas orchard of 100 acres, which has produced 69,000 boxes of high grade apples during the past two seasons.

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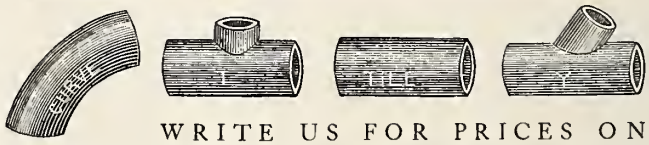

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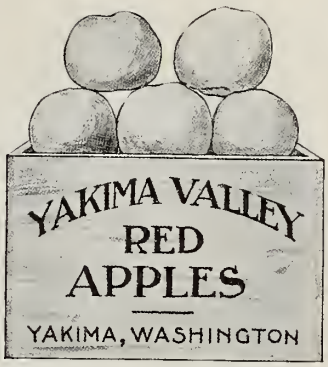
ST. PAUL, MINN.

What One Man Has Done Others Can Do:



North Yakima, Wash.,
Feb. 15, 1909.

Mr. C. W. Mott,
G. E. A., N. P. Ry.,
St. Paul, Minn.

Dear Sir: — I own 20 acres; paid $100 an acre for same in 1884. Could sell now for $2,500 an acre. It is all in apples, peaches, pears and apricots. My average crop is $7,000 for the apples; $1,500 for the pears, and $1,500 for the peaches and apricots. Have got $1,200 off one acre of Rome Beauty apples. Yours truly,

W. L. Wright

HOOD RIVER

GROWS THE BEST APPLES IN THE WIDE WORLD

Hood River holds the high price record for nine years on Spitzenbergs and Newtowns.

Hood River apple pack is the only pack selling on the English market without the box being opened.

Hood River apples and pack are guaranteed. The seal of quality.

Hood River is the only fruit section in the world with a University Club. Over 100 members are fruit growers.

Hood River scenery is the grandest in the Northwest.

Hood River is healthy. Its water pure. Climate ideal.

Hood River people have health, wealth and happiness.

Hood River orchardists are clearing from $300 to $1,000 per acre.

Hood River Valley, its apples and people, are a class by themselves.

Hood River is just beginning to develop and set the upper valley to orchards. It is the best deep volcanic ash soil. I sold my place in the lower valley and bought in the upper valley because I could get more land for less money. I have 160 acres set to orchard not for sale. I have 160 acres ready to set. Price, $250 per acre. I will subdivide in 10, 20 and 40-acre tracts. This land in the lower valley would sell for $1,000 per acre. I have a few choice 10, 20 and 40-acre tracts, uncleared, at from $50 to $150 per acre. *Write for further particulars, or call on*

G. D. WOODWORTH, HOOD RIVER, OREGON

HOOD RIVER

Apples are the World's Standard

Steinhardt & Kelly, New York City, had this magnificent oil painting, costing $300.00, framed in gold, and presented it to the Hood River Apple Growers' Union. Steinhardt & Kelly bought the crop last year, and say the finest apples in the wide world are grown in the Hood River Valley, Oregon, and packed by the Hood River Apple Growers' Union, and are sold by Steinhardt & Kelly, 101 Park Place, New York

Greatest Apple Growing Valley in the World

Where fruit pays from $500 to $1,800 per acre and is marketed for you at the highest prices paid anywhere in the world, while still on the tree. Forty thousand acres of finest apple land still undeveloped. One hundred thousand horsepower going to waste in its streams. Population, 6,000. Value fruit products, 1909, $800,000; value lumber output, 1907, $750,000; taxable property, $2,700,000; bank deposits, 1901, $36,000; 1908, $900,000. Railroad and water transportation. Two hours from Portland, twelve hours from Seattle and Spokane. Rural and city mail delivery. Phone and electric light service covering city and valley. Let us tell you about it. Do it now—today. Address

HOOD RIVER COMMERCIAL CLUB, DEPT. A, HOOD RIVER, OREGON

There's a Fortune Waiting for You in

NUTLAND HILLS

On the New North Bank Railway On the Washington Side of the Columbia River

Almonds, Walnuts, Apricots Tokay Grapes

There is no other locality outside Italy and France where the Tokay grape can be grown in such quantities as on the sun-bathed slopes of Nutland Hills—"The Italy of America."

APRICOTS—Are a most successful and money-making crop.
POTATOES—Of the large, mealy variety grow in abundance.
MELONS—Grow to enormous size, and there is a ready market.

Five and ten acre tracts on easy payments
A postal card will bring you all information

Then We Have Beautiful

RIVERSIDE ORCHARDS

On the Yamhill River at McMinnville, Oregon. "A Perfect Paradise for a Home." Where any man may buy a five or a ten acre tract and make it pay for itself. We will make the terms easy, and if you do not desire to live on the place at once we will care for the orchard until it is yielding you a good income, when you can take charge and be absolutely independent of all the world.

Will you write us a postal today?
If you do we will show you the way to win

THE JACOBS-STINE COMPANY

THE LARGEST REAL ESTATE FIRM ON THE PACIFIC COAST

Local and Long Distance Phones: Pacific Main 6869; Home A 6267

146½ FIFTH STREET PORTLAND, OREGON

SUMMER RATES EAST

DURING THE SEASON 1909
VIA THE

OREGON RAILROAD & NAVIGATION CO.

Oregon Short Line and Union Pacific Railroad

FROM

Portland, Seattle, Spokane, Tacoma, Walla Walla and all points on the O. R. & N. Line

To Omaha and Return $60
To Kansas City and Return $60
To St. Louis and Return $67.50
To Chicago and Return $72.50

and to other principal cities in the East, Middle West and South at correspondingly low rates

August 11, 12

To Denver and Return $55

On Sale August 11

Going transit limit 10 days from date of sale, final return limit October 31st.

These tickets present some very attractive features in the way of stopover privileges, and choice of routes; thereby enabling passengers to make side trips to many interesting points enroute.

Routing on the return trip through California may be had at a slight advance over the rates quoted.

Full particulars, sleeping car reservations and tickets will be furnished by any O. R. & N. local agent, or

Wm. McMurray
General Passenger Agent Portland, Oregon

NOW IS THE TIME TO BUY

APPLE LAND

IT WILL NEVER BE CHEAPER

I can offer you the greatest bargain in the Hood River-White Salmon fruit belt

Apples from White Salmon Valley

National Apple Show, Spokane, Washington

One-half mile from Husum, six and one-half miles from Underwood. Nearly all cleared and ready to plant trees. Land gently rolling; soil same as Hood River. Abundance of spring and river water. On main county road, telephone line, etc. One mile from electric light plant. Can be irrigated. All land strictly first-class. Unsurpassed opportunity to develop big commercial orchard, or will subdivide. Address

JAS. W. MILL
P. O. Box 312 Hood River, Oregon

MOSIER

The Natural Home of Newtown and Spitzenberg Apples

Apple Land

Good, Better, Best at Prices Lower than Less Valuable Land in Other Localities

MOSIER APPLES AT HOOD RIVER FAIR

Scenery, climate, water and general conditions unsurpassed for residence, and for the raising of all kind of fruit. Mosier is a Siamese twin to Hood River (6 miles east) in the fruit industry

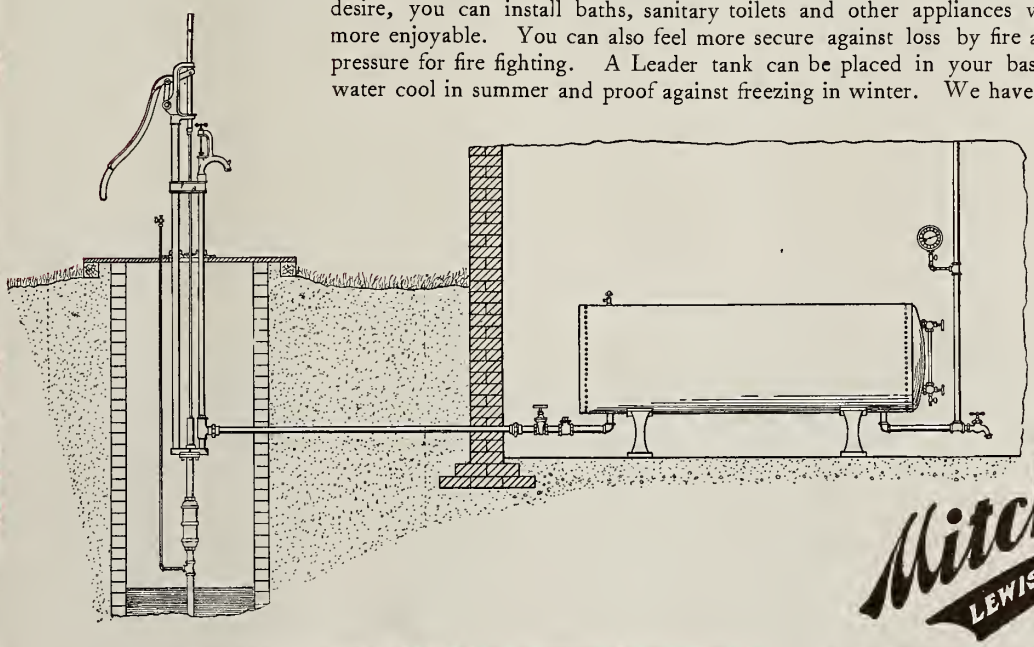
Further Information Gladly Furnished by

Commercial Club of Mosier Valley
MOSIER, OREGON

Leader Pneumatic Water Systems

Increase { Home Comfort / The Value of Your Property

A LEADER SYSTEM gives you all the conveniences of the city, no matter where your property and home may be. With it installed in your house you can have running water in every room, if you desire, you can install baths, sanitary toilets and other appliances which tend to make country life more enjoyable. You can also feel more secure against loss by fire as Leader tanks maintain a good pressure for fire fighting. A Leader tank can be placed in your basement, out of sight, making the water cool in summer and proof against freezing in winter. We have leader tanks in various sizes and can furnish pumps of proper capacity for same. Tell us what your conditions are and our pump man will recommend an outfit best suited to your needs. Remember, it costs you nothing to ask and places you under no obligations to us



Mitchell Lewis & Staver Co.

PORTLAND OREGON
SPOKANE WASHINGTON
BOISE IDAHO
SALEM OREGON

To Commission Merchants and Brokers

CHAPTER IV.

In Chapter III. we brought the attention of Shippers to the advantages of trading with Bonded Commission Merchants and Bonded Brokers. This letter is to call the attention of Commission Merchants and Brokers to the advantages of acting as Produce Reporter Company's Brokers or Produce Reporter Company's Commission Merchants. This connection is not open to any firm rated less than "XXX," and a bond has to be furnished from the United Surety Company of Baltimore. All arrangements have been made by this organization with said surety company to immediately accept such firms as are satisfactory to us. Such applicants for this position will be printed in heavy, black-faced type in our next Credit Book, and in the meanwhile will be printed in black-faced type under the head of "New Bonded Commission Merchants" or "New Bonded Brokers" in the Weekly Credit Sheet which goes to each member. This is influential publicity that **gets business** and makes it worth while for the up-to-date broker or commission merchant to ally himself with this organization and assist in the marketing of its shipping members' goods. As this organization has more members than all other shipping organizations in the United States put together, the connection is very valuable.

This is a high-class, dignified proposition, accepted by some of the largest, wealthiest, oldest and most reliable commission houses in the United States, with whom you might well be proud to be associated. It has proved profitable to them and will to you.

Write for particulars to

PRODUCE REPORTER COMPANY

34 SOUTH CLARK STREET CHICAGO, ILLINOIS

Steinhardt & Kelly

101 Park Place, New York

The largest and most extensive fruit concern in the world operating in all the fruit growing sections of the civilized globe

---

Exclusive Purveyors of High Class Fruits

STEINHARDT & KELLY HANDLE MORE

BOX APPLES

THAN ANY OTHER CONCERN IN THE COUNTRY

and was the first fruit house to extensively introduce the Northwestern product to the consumers of the East. With able representation in all the leading markets STEINHARDT & KELLY are enabled to handle the entire crops of the most extensive districts with utmost ease and celerity

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CORRESPONDENCE WITH ASSOCIATIONS, UNIONS AND INDIVIDUAL GROWERS WILL BE GIVEN PERSONAL ATTENTION